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HARVARD SCHOOL  
OF  
PUBLIC HEALTH

*Announcement of Courses  
and General Information*

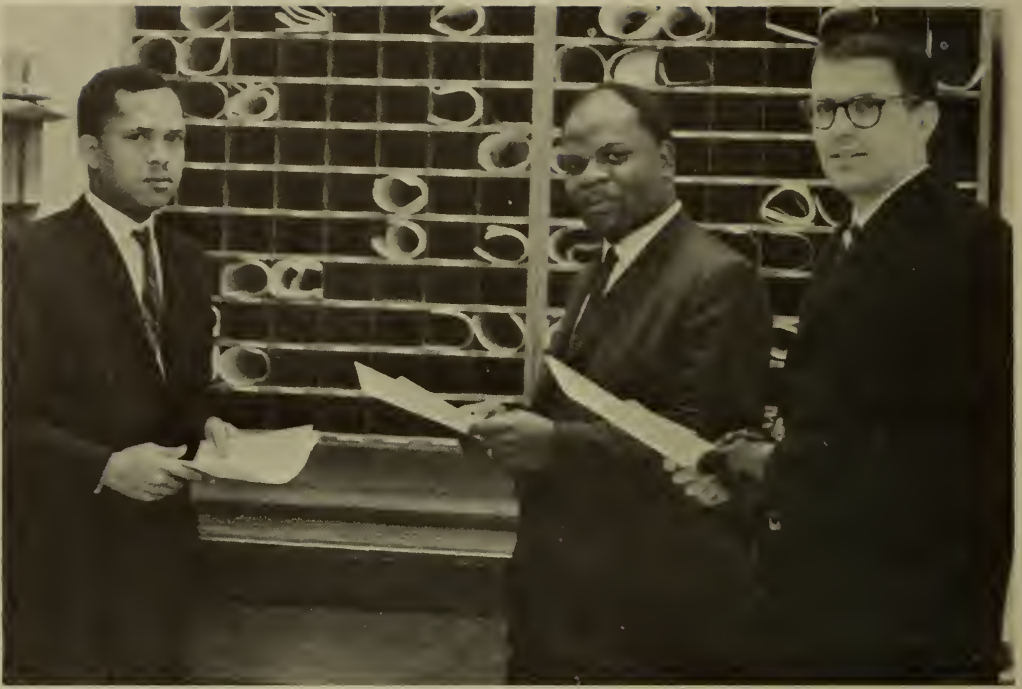


1966-67

*55 Shattuck Street, Boston, Massachusetts 02115*

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PUBLISHED BY THE UNIVERSITY



Graduate students from many parts of the world come to study in Harvard's School of Public Health. Physicians, engineers, physical scientists, social scientists, and other health specialists prepare here for careers of leadership in teaching, research and the administration of health services, both nationally and internationally.

The Harvard School of Public Health operates as an autonomous unit of Harvard University in close association with the Faculties of Arts and Sciences, Public Administration, Business Administration, Education, Medicine and Dental Medicine.





# ONE

## CONTENTS

### INTRODUCTORY INFORMATION

THE ACADEMIC CALENDAR	9
PRESIDENT AND FELLOWS OF HARVARD COLLEGE	11
ADMINISTRATION OF THE HARVARD SCHOOL OF PUBLIC HEALTH	12
The Administrative Officers	12
The Administrative Board	14
OFFICERS OF INSTRUCTION AND RESEARCH	15
The Faculty of Public Health	15
The Teaching Staff	21
The Research Staff	26
Professors Emeriti	32
THE SCHOOL AND ITS FACILITIES	34
History of the School	34
Objectives of the School	35
Dual Role of the School	36
New Program of Instruction	37
Programs for Specialists	38
The Location and Buildings	38
Other Facilities	39
Libraries	40
Shattuck International House	42

# TWO

### ADMISSION AND DEGREES

APPLICATION FOR ADMISSION	49
LIVING EXPENSES	50
COURSES OF STUDY AND DEGREES	51
Master of Public Health	51
Master of Science in Hygiene	53
Master of Industrial Health	55
Doctor of Public Health	56
Doctor of Science in Hygiene	57
REQUIREMENTS FOR DOCTORAL DEGREES	57

Residency Programs	60
Special Students	61
Degrees in Engineering	61

# THREE

## CONTENT OF COURSES

BIOSTATISTICS	65
EPIDEMIOLOGY	70
KRESGE CENTER FOR ENVIRONMENTAL HEALTH	75
Environmental Health Courses	76
Industrial Hygiene	81
Physiology	85
Sanitary Engineering	89
CENTER FOR THE PREVENTION OF INFECTIOUS DISEASES	91
Microbiology	92
Tropical Public Health	101
HEALTH SERVICES ADMINISTRATION	110
MATERNAL AND CHILD HEALTH	118
NUTRITION	123
BEHAVIORAL SCIENCES	129
CENTER FOR POPULATION STUDIES	134
DEMOGRAPHY AND HUMAN ECOLOGY	136
INTERDEPARTMENTAL COURSES	140

# FOUR

## SPECIAL PROGRAMS

PROGRAMS IN INTERNATIONAL HEALTH	145
HARVARD UNIVERSITY INTERFACULTY PROGRAM ON HEALTH AND MEDICAL CARE	151
POSTDOCTORAL FELLOWSHIP PROGRAM IN DENTAL PUBLIC HEALTH	153

# FIVE

## GENERAL INFORMATION

REGISTRATION	157
INTERNATIONAL STUDENTS	157
FEEES AND EXPENSES	158
STUDENT HEALTH SERVICE	161
HOUSING	163
EMPLOYMENT	164
FELLOWSHIPS AND TRAINEESHIPS	164
STUDENTS 1965-1966	167
GEOGRAPHICAL ORIGINS OF STUDENTS	171
DEGREES CONFERRED IN JUNE, 1965 AND MARCH, 1966	172
INDEX TO OFFICERS OF ADMINISTRATION, INSTRUCTION AND RESEARCH	176
SUBJECT INDEX	180



This modern building of the Harvard School of Public Health houses the Kresge Center for Environmental Health, the Guggenheim Center for Aerospace Health and Safety, the Nutrition Research Laboratories, and the Department of Demography and Human Ecology, a part of the Center for Population Studies.

# ONE

## INTRODUCTORY INFORMATION





# ACADEMIC CALENDAR-1966-1967

**\*SEPTEMBER 12, MONDAY, 10 A.M.** Opening session and registration for new International Students

**\*SEPTEMBER 14, WEDNESDAY, 2 P.M.** Opening session and registration for new U.S. Students

The period between the opening sessions and September 23 will be devoted to individual conferences with faculty members, selection of courses of study and orientation lectures

**\*SEPTEMBER 19, MONDAY, 10 A.M.** Opening session and registration for students enrolled in 1965-66

## FALL TERM, SEPTEMBER 26, 1966 TO FEBRUARY 4, 1967

**SEPTEMBER 26, MONDAY** First Period Courses begin

**OCTOBER 12, WEDNESDAY** Columbus Day: a holiday

**OCTOBER 14, FRIDAY** Last day for changes in "a" and "a,b" courses of study

**NOVEMBER 11, FRIDAY** Veterans' Day: a holiday

**NOVEMBER 19, SATURDAY** First Period ends

**NOVEMBER 21, MONDAY** Second Period Courses begin

**NOVEMBER 24, THURSDAY** Thanksgiving Day: a holiday

**DECEMBER 9, FRIDAY** Last day for changes in "b" courses of study

## Recess from Thursday, December 22, 1966 to January 4, 1967

**JANUARY 28, SATURDAY** Second Period Courses end

**JANUARY 30, MONDAY TO FEBRUARY 4, SATURDAY** Directed reading period, supervised special studies or field observations

\* All students are required to attend the opening session and to be present for the registration period.

## **SPRING TERM, FEBRUARY 6, 1967 TO JUNE 15, 1967**

<b>FEBRUARY 6, MONDAY</b>	Third Period Courses begin
<b>FEBRUARY 22, WEDNESDAY</b>	Washington's Birthday: a holiday
<b>FEBRUARY 24, FRIDAY</b>	Last day for changes in "c" and "c,d" courses of study
<b>APRIL 1, SATURDAY</b>	Third Period ends

## **Recess from Sunday, April 2, 1967 to Sunday, April 9, 1967**

<b>APRIL 10, MONDAY</b>	Fourth Period Courses begin
<b>APRIL 28, FRIDAY</b>	Last day for changes in "d" courses of study
<b>MAY 30, TUESDAY</b>	Memorial Day: a holiday
<b>JUNE 3, SATURDAY</b>	Fourth Period ends
<b>JUNE 5, MONDAY TO JUNE 14, WEDNESDAY</b>	Post-class Period — Forums
<b>JUNE 15, THURSDAY</b>	Commencement

Memorial  
Church,  
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- \*MORRIS SIEGEL M.D., M.P.H., Visiting Lecturer on Epidemiology; *Professor of Environmental Medicine and Community Health, State University of New York Downstate Medical Center.*

## SCHOOL OF PUBLIC HEALTH

- \*SAMUEL WILLIAM SIMMONS S.B., A.M., Ph.D., Visiting Lecturer on Tropical Public Health; *Scientist Director and Chief, Technology Branch, Communicable Disease Center.*
- \*JOHN MARSHALL WEIR S.B., M.D., Ph.D., M.P.H., Visiting Lecturer on Tropical Public Health; *Director, Medical and Natural Sciences, The Rockefeller Foundation.*

## INSTRUCTORS

- CLIFTON AUGUSTUS BAILE S.B., Ph.D., Instructor in Nutrition.
- \*HELEN DOROTHY COHN M.P.H., Instructor in Applied Public Health Nursing; *Assistant Professor of Public Health Nursing, Boston University School of Nursing.*
- \*ILSE ELISE GORBACH A.B., M.D., M.P.H., Instructor in Maternal and Child Health.
- MADGE LOUISE MYERS A.B., S.M., Instructor in Nutrition.
- PATRICIA STEFANIK REMMELL S.B., S.M., Instructor in Nutrition.
- ALVAN GERALD RENTHAL A.B., M.D., M.P.H., Instructor in Health Services Administration.
- \*BENJAMIN SACHS A.B., M.D., M.P.H., Instructor in Maternal and Child Health; *Health Commissioner, Cambridge Health Department and Regional Director, Massachusetts Department of Public Health.*
- \*CATHERINE COOLIDGE SEARS A.B., M.D., M.P.H., Instructor in Tropical Health.
- \*HENRY WECHSLER A.B., A.M., Ph.D., Instructor in Social Psychology; *Research Director, The Medical Foundation, Inc.*

## HARVARD UNIVERSITY

- \*JOSEPH ANTHONY YACOVONE A.B., D.M.D., M.P.H., Instructor in Dental Public Health; *Chief, Division of Dental Public Health, Rhode Island Department of Health.*

### TEACHING FELLOW

- \*CHARLES NEAVE A.B., M.D., M.P.H., Teaching Fellow in Epidemiology.

## THE RESEARCH STAFF

### SENIOR RESEARCH ASSOCIATES

- ‡HARRY HEIMANN S.B., M.D., Senior Research Associate in Environmental Health and Lecturer on Occupational Medicine.
- ‡‡RICHARD LEWIS WOODWARD B.S.C.E., S.M., Ph.D., Senior Research Associate in Sanitary Engineering; *Lecturer on Environmental Health Sciences and Engineering.*
- ‡JOHN BENJAMIN WYON B.A., M.B., B.Ch., M.P.H., Senior Research Associate and Lecturer in Population Studies.
- ‡ALFRED YANKAUER A.B., M.D., M.P.H., Senior Research Associate in Maternal and Child Health.
- NORMAN HUMPHREY MACKWORTH M.B., Ch.B., Dr.Phil., Senior Research Associate in Physiological Psychology; *Research Fellow in Cognitive Studies.*

### RESEARCH ASSOCIATES §

- HARBEN JAY BOUTOURLINE-YOUNG M.B., B.S., D.C.H., M.D., Research Associate in Physiology (Absent 1966-67).
- HECTOR ANTONIO CASTELLANOS B.Sc., B.Med., M.D., Research Associate in Nutrition.

‡ Appointments with administrative tenure

§ Term appointments.

## SCHOOL OF PUBLIC HEALTH

ROBERT ALLEN DANLEY	A.B., S.M., Ph.D., Research Associate in Sociology.
HELEN GIDEON	M.B.,B.S., M.P.H., Research Associate in Population Studies (Absent 1966-67).
ROLAND CHESLEY MOORE	A.B., A.M., Ph.D., Research Associate in Occupational Safety.
MANUEL ROCA-GARCIA	M.D., M.P.H., Research Associate in Microbiology.
CARL COLEMAN SELTZER	A.B., Ph.D., Research Associate in Physical Anthropology.
FREDERICK JAMES VILES, JR.	S.B., S.M., Research Associate and Lecturer on Industrial Hygiene.
JOHN WILLIAM VINSON	S.B., S.D. in Hyg., Research Associate and Lecturer on Microbiology.

## RESEARCH ASSOCIATES

MARIA BANASIEWICZ	M.D., M.P.H., Research Associate in Nutrition.
*MARTHA DRESNER BERLINER	A.B., S.M., Ph.D., Research Associate in Microbiology; <i>Instructor in Biology, Simmons College.</i>
JOSEPH DAVID BRAIN	A.B., S.M., S.M. in Hyg., S.D. in Hyg., Research Associate in Physiology.
*RUTH MARGARET BUTLER	A.B., S.M., Research Associate in Social Work; <i>Professor of Human Behavior and Social Environment, Boston College School of Social Work.</i>
*DOROTHY BLAKE CHAMBERLIN	S.B., M.D., M.P.H., Research Associate in Physiology.
*ARTHUR PHILIP CONNELLY, JR.	A.B., M.D., Research Associate in Medicine; <i>Assistant Physician, University Health Services.</i>
THOMAS JOSEPH CROWLEY	S.B., S.M., Research Associate in Environmental Health and Safety.



## HARVARD UNIVERSITY

JEANNETTE HOLZAPFEL FORSYTH	A.B., Ph.D., Research Associate in Nutrition.
*CHARLES EDWARD OVID FRASER	B.V.Sc., M.R.C.V.C., D.T.V.M., S.M., Research Associate in Microbiology; <i>Microbiologist, New England Regional Primate Research Center.</i>
NICHOLAS FREYDBERG	S.B., Ph.D., Research Associate in Social Psychology.
*KENNETH FRANCIS GIRARD	S.B., M.Sc., Ph.D., Research Associate in Microbiology; <i>Assistant Director, Division of Diagnostic Laboratories, Massachusetts Department of Public Health.</i>
RUTH FRANCES GROMMERS	S.B., M.D., M.P.H., Research Associate in Environmental Health.
WILLIAM BOYD HOOD	S.B., M.D., Research Associate in Medicine.
AGNES MAYER HUBER	B.Sc., Ph.D., Research Associate in Nutrition.
MICHAEL CHARLES LATHAM	B.A., M.D., D.T.M.&H., M.P.H., Research Associate in Nutrition.
DAVID EVAN LEITH	A.B., M.D., Research Associate in Physiology.
*VICTOR LORIAN	M.D., Research Associate in Microbiology; <i>Director, Clinical and Research Laboratories, Sanatorium Division, Boston City Hospital, and Assistant Clinical Professor, Boston University School of Medicine.</i>
JAMES RICHARD MAHONEY	S.B., Ph.D., Research Associate in Meteorology.
MARY BEATRICE MC CANN	S.B., M.P.H., M.D., Research Associate in Nutrition.
HARRY LOUIS MC COMBS	S.B., M.D., Research Associate in Pathology.

## SCHOOL OF PUBLIC HEALTH

- |                                 |   |
|---------------------------------|---|
| *JOSEPH MORTON MILLER           | A.B., M.D., M.P.H., Research Associate in Medicine; <i>Associate in Medicine, Peter Bent Brigham Hospital and Medical Director, Massachusetts Bay Transportation Authority.</i> |
| LEO MILLER                      | A.B., S.M. in S.S., M.P.H., Ph.D., Research Associate in Social Work.   |
| ALICE LONGAKER NANGERONI        | A.B., Research Associate and Administrative Assistant in Behavioral Sciences.   |
| JAY HAMILTON NOLAN              | A.B., A.M., Research Associate in Anthropology.   |
| FREDRIC RUSSELL OLSEN           | A.B., Research Associate in Nutrition.  |
| JOHN HERMAN PETERS              | S.B., M.D., Research Associate and Lecturer on Microbiology.  |
| RONALD MAXWELL PICKETT          | A.B., A.M., Ph.D., Research Associate in Experimental Psychology.   |
| MARIE EBE RECA                  | Dr.Chem., Research Associate in Medical Mycology.   |
| *HEDWIG ELIZABETH ROSE          | M.B.,Ch.B., Research Associate in Pediatrics; <i>Assistant School Physician, Town of Brookline.</i>   |
| CONSTANTINA SAFILIOS-ROTHSCHILD | S.M., Ph.D., Research Associate in Population Studies.  |
| LUISA CORA STIGOL               | M.D., Research Associate in Physiology.   |
| *JOHN MASON TYLER               | A.B., M.D., Research Associate in Physiology; <i>Senior Physician and Director of the Pulmonary Laboratory, Lemuel Shattuck Hospital.</i>                                       |
| VYTAUTAS IGNAS UZGIRIS          | A.B., S.B., M.D., Ph.D., Research Associate in Population Studies.  |
| *HERNAN VELEZ                   | M.D., Clinical Research Associate in Nutrition; <i>Associate Professor of Internal Medicine, School of Medicine, University of Medellin, Colombia.</i>                          |

## HARVARD UNIVERSITY

NORBERT LEONARD WIECH S.B., S.M., Ph.D., Research Associate in Nutrition.

\*GRACE CHEN YUAN B.Sc., M.D., Research Associate in Microbiology.

### RESEARCH AND FIELD STAFF

\*RODERICK ANTONY ARMSTRONG B.A., L.M., S.S.A., Research Consultant in Social Psychiatry; *Executive Director, Digby-Annapolis Mental Health Service Board, Inc.*

VICTOR GEORGE CARDOZA Field Project Administrator.

### SENIOR RESEARCH FELLOW

WEN-PING TSENG M.D., Senior Research Fellow in Epidemiology.

### RESEARCH FELLOWS

ELIHU ARTHUR CHANNIN A.B., M.D., Research Fellow in Physiology.

EMILE SHENUDA DEMIAN B.Sc., M.Sc., Ph.D., Research Fellow in Tropical Public Health.

CHARLES EDWARD ELSON S.B., S.M., Ph.D., Research Fellow in Nutrition.

ALI MOHAMMED FAKHRO M.D., Research Fellow in Nutrition.

ARTUR MACIEJ GALAZKA M.D., Research Fellow in Microbiology.

DONALD EDWARD GILBERTSON S.B., S.M., Ph.D., Research Fellow in Tropical Public Health.

MARGARET HITCHCOCK B.Sc., Ph.D., Research Fellow in Physiology.

## SCHOOL OF PUBLIC HEALTH

SAMUEL BURT ITSCHOITZ	M.D., Research Fellow in Nutrition.
ELIESER KAPLINSKY	M.D., Research Fellow in Nutrition.
RONALD JOEL KNUDSON	S.B., M.D., Research Fellow in Physiology.
ARTHUR WILLIAM MAHONEY	S.B., Ph.D., Research Fellow in Nutrition.
BRIAN MC CARTHY	B.Agr.Sc., M.Agr.Sc., Ph.D., Research Fellow in Nutrition.
RALPH ENGLISH MILLER, JR.	A.B., M.D., S.M. in Hyg., Research Fellow in Physiology.
GUY JEAN ROBERGE	A.B., M.D., Research Fellow in Nutrition.
GERALD ANTHONY RYAN	M.B.,B.S., M.D., Research Fellow in Biotechnology.
CARLOS ERNESTO VASSAUX	B.S., M.D., Research Fellow in Nutrition.
AMNON WACHMAN	S.B., M.D., Research Fellow in Nutrition.
ROBERT JOHN MAC LEOD WILSON	B.Sc., Ph.D., Research Fellow in Tropical Public Health.
STEPHEN MARTIN WITTENBERG	A.B., M.D., Research Fellow in Nutrition.
STELLA BERNADETTE YEN	M.P.H., Research Fellow in Epidemiology.

## ASSISTANTS

ETHEL JAFARIAN BOWIE	S.B., Assistant in Nutrition.
DOROTHY BRUNO	S.B., Assistant in Nutrition.
CHARLYNE DEAN COSTIN	A.B., M.S.S.W., Assistant in Social Work.
* RUTH ADA COWIN	S.B., S.M., Assistant in Social Work.
SHEILA NORA CRONIN	S.B., S.M., Assistant in Nutrition.

## HARVARD UNIVERSITY

MIRIAM CATHERINE EKDAHL	S.B., S.M. in S.S., Assistant in Social Work.
CARMINA MARGARET GORDON	B.A., B.S.W., M.S.W., Assistant in Social Work.
MARGARET BLANCHE HOFF	A.B., S.M., Assistant in Biostatistics and Maternal and Child Health.
* LEO LEVINE	S.B., Assistant in Microbiology; <i>Chief of Laboratory, Biologic Laboratories, Massachusetts Department of Public Health.</i>
GERTRUDE MC CARTHY	S.B., S.M., Assistant in Social Work.
DOROTHY ELIZABETH MC COMB	S.B., Assistant in Microbiology.
MARY LOUIE NEW	S.B., M.P.H., Assistant in Biostatistics.
JANE DRISCOLL O'CONNOR	S.B., Assistant in Microbiology.
JANE ANN SCHOONMAKER	S.B., S.M., Assistant in Nutrition.
* JUDITH MILLER SPIELMAN	S.B., S.M. in Hyg., Assistant in Microbiology.
AMORITA CASTRO SUAREZ	S.B., Assistant in Behavioral Sciences.

## PROFESSORS EMERITI

DONALD LESLIE AUGUSTINE	S.B., S.D., S.D. (hon.), A.M. (hon.), Professor of Tropical Public Health, Emeritus (1961).
BERTHA SHAPLEY BURKE	A.B., A.M., Associate Professor of Maternal and Child Nutrition, Emerita (1960).
PHILIP DRINKER	S.B., Chem.E., S.D. (hon.), LL.D., A.M. (hon.), Professor of Industrial Hygiene, Emeritus (1961).
MARTHA MAY ELIOT	A.B., M.D., L.H.D., S.D. (hon.), LL.D., Professor of Maternal and Child Health, Emerita (1960).



## SCHOOL OF PUBLIC HEALTH

GORDON MASKEW FAIR	S.B., S.M. (hon.), Dr.Ing. (hon.), Dr. (hon.), Sc.D. (hon.), Abbott and James Lawrence Professor of Engineering, and Gordon McKay Professor of Sanitary Engineering, Emeritus (1965).
FRANZ GOLDMANN	M.D., Associate Professor of Medical Care, Emeritus (1958).
JOHN EVERETT GORDON	S.B., Ph.D., M.D., A.M. (hon.), F.R.C.P. (Lond.), Professor of Preventive Medicine and Epidemiology, Emeritus (1958).
ALICE HAMILTON	M.D., A.M. (hon.), S.D. (hon.), Assistant Professor of Industrial Medicine, Emerita (1935).
HUGH RODMAN LEAVELL	S.B., M.D., Dr.P.H., Professor of Public Health Practice, Emeritus (1963).
HUGO MUENCH	A.B., M.D., Dr.P.H., A.M. (hon.), Professor of Biostatistics, Emeritus (1961).
GEORGE CHEEVER SHATTUCK	A.B., M.D., A.M. (hon.), Clinical Professor of Tropical Medicine, Emeritus (1947).
RICHARD MASON SMITH	A.B., M.D., S.D. (hon.), Thomas Morgan Rotch Professor of Pediatrics, Emeritus (1946).
HAROLD COE STUART	Litt.B., M.D., A.M. (hon.), Professor of Maternal and Child Health, Emeritus (1958).

## *The School and Its Facilities*

The Harvard School of Public Health is primarily devoted to graduate education in public health and its aim is to provide opportunities for those who seek careers in one or more of the principal areas of public health activities—teaching, research, and the administration of health services, both nationally and internationally.

Public health evolved from the early combination of medical science and engineering for the control of environmental hazards. It has grown to embrace various facets of the biological, physical and social sciences as community aspects of health problems have become more complex and demanding. Public health now depends upon the skills and knowledge of members of several professions. The role of a graduate school of public health today is to prepare those who will be concerned with health problems which lie outside the scope of any single discipline, problems which can be solved best by the skillful cooperation of physicians, engineers, physical scientists, social scientists and other health specialists.

### **HISTORY OF THE SCHOOL**

Activity in professional education in the field of public health had been steadily increasing in Harvard University over a period of more than two decades before the actual founding of the School, in 1922. The development was a gradual one, characterized by certain important steps, the first of which was the establishment in 1909 of the Department of Preventive Medicine and Hygiene in the Medical School—the first such department in the United States. The degree of Doctor of Public Health was first conferred in 1911. In this same year a Department of Sanitary Engineering was inaugurated in the Graduate School of Engineering. In 1913 the Department of Tropical Medicine, and in 1918 the Division of Industrial Hygiene, with clinical and laboratory facilities, were organized in the Harvard Medical School.

In 1913 the Harvard-Massachusetts Institute of Technology School for Health Officers was formed under the joint management of Harvard University and the Massachusetts Institute of Technology. This School operated until the fall of 1922, when it was superseded by the Harvard School of Public Health which was made possible by a generous endowment for this purpose from The Rockefeller Foundation.

When the School first opened, several departments were set up as joint departments with the Medical School, with shared facilities, faculty and budgets. This arrangement continued until 1946 when another grant from The Rockefeller Foundation provided additional space and facilities for the School of Public Health. At this time the School was separated administratively and financially from the Medical School and became an autonomous unit of Harvard University. It continues to cooperate with the Medical School in teaching and research, and has also developed close association with other schools of the University, particularly the Graduate Schools of Arts and Sciences, Public Administration and Business Administration.

### OBJECTIVES OF THE SCHOOL

The objectives of the School of Public Health are the advancement and dissemination of knowledge relating to human health and well-being. To fulfill these objectives the School provides instruction to graduate students and research fellows, conducts research, and participates in national and international health activities.

In its efforts to advance knowledge, the School is concerned with health problems of major importance to society, not only in the highly urbanized and technologically advanced regions, but also in the predominantly rural or economically disadvantaged areas of the world.

The educational program of the School provides advanced instruction in the community-oriented health sciences and in the techniques of administration for highly qualified young men and women who have potential for imaginative leadership.



In its involvement in the contemporary health problems of society, the School collaborates with community leaders in seeking ways in which knowledge can be effectively used for the advancement of human health. The School is particularly concerned with the development of realistic social policies in relation to health problems and population growth.

### **DUAL ROLE OF THE SCHOOL**

The School has come to recognize that it must assume the dual role of (1) a professional school that provides for the generalist a comprehensive broad program of basic knowledge in relevant health sciences and (2) a graduate school that provides advanced instruction and opportunities for independent study in depth for



those students who seek to become specialists in one of the public health disciplines. To fulfill these roles, two quite different degree programs are offered. One involves the professional degrees of Master and Doctor of Public Health with a wide range of required subjects. Candidates for these degrees must be graduates of approved schools of medicine, dentistry or veterinary medicine; in some cases, qualified individuals who hold doctoral degrees in the biological sciences may be admitted to the program.

The other type of program leads to the degrees of Master and Doctor of Science in Hygiene in a chosen field, and provides the opportunity to concentrate intensively in an area of special interest. The backgrounds of the candidates for these degrees range across the physical, biological and social sciences—engineers, health educators, nurses, nutritionists, social workers and statisticians. Individuals with a doctoral degree in the medical or biological sciences may elect these programs if they prefer a specialized area of study.

### NEW PROGRAM OF INSTRUCTION

In its role as a professional school, the Harvard School of Public Health emphasizes postgraduate medical education. For several years the School has been engaged in a study of its curriculum which has included Faculty discussions, conferences with alumni, students, and officials of various institutions in the United States and abroad.

As a result of this study the Faculty recently voted to adopt a new curriculum for the professional degree of Master of Public Health. Beginning in the fall of the academic year 1966–67, all candidates in the Master of Public Health program will study not only the traditional disciplines of biostatistics, epidemiology, administration and environmental sanitation, but also other disciplines and problem areas of general importance. Included in the latter category are such subjects as the provision of health services and medical care, maternal and child health, population growth and fertility control, ecology and epidemiology of infectious diseases, history and philosophy of public health, public health nutrition,



## **HARVARD UNIVERSITY**

the human community, mental health and special problems in environmental health — air and water pollution, occupational medicine, radiation hazards and accident prevention.

A new course on policies in public health has been designed and will also be required of Master of Public Health candidates. The course deals with programs for prevention and control of major health problems, including the chronic diseases.

The balance of the Master of Public Health program is to be devoted to elective courses, seminars and tutorial work, chosen by the student on the basis of his field of interest.

During the week between the end of formal classes and Commencement in June a series of forums is planned to consider public issues. They will be discussion sessions led by members of the Faculty and visiting experts, with active participation by the students.

The new requirements should assure that those who earn the Master of Public Health degree will have comprehensive preparation for responsible positions in public health.

## **PROGRAMS FOR SPECIALISTS**

In its role as a graduate institution, the School offers a wide variety of intensive programs for individuals who wish to concentrate in a special area of public health. These programs are available to candidates for the degree of Master of Science in Hygiene or Master of Industrial Health. Many of the courses for the Master of Public Health curriculum are open to candidates for the other Master's degrees but enrollment in certain courses is restricted to students with a medical degree or similarly thorough preparation in the biological sciences. More than 60 elective courses are offered in the twelve departments of the School, covering all important areas of concern in public health.

## **THE LOCATION AND BUILDINGS**

Most departments of the School of Public Health are housed in four buildings: the Rotch Building at 55 Shattuck Street, the

Huntington Building at 1 Shattuck Street, and two research buildings at 665 Huntington Avenue, Boston. The administrative offices are in the Rotch Building. The School's buildings are adjacent to the Harvard Medical and Dental Schools, the Children's Medical Center, the Peter Bent Brigham Hospital, and the Boston Lying-In Hospital.

### OTHER FACILITIES

The facilities of the hospitals and the adjacent institutions are available to qualified students of this School, and are used in connection with the teaching of various subjects. In addition, students enrolled at the School may take courses in other departments of Harvard University, such as in the social sciences, public administration, economics, statistics and medical sciences. Certain graduate courses at the Massachusetts Institute of Technology are also open to students of this School.

The Department of Sanitary Engineering of the School is also part of the Division of Engineering and Applied Physics of the Harvard Graduate School of Arts and Sciences in Cambridge. Qualified students may register for courses given by the Division of Engineering and Applied Physics.

The School maintains a close association with a wide variety of health, medical care, and welfare organizations in Massachusetts and elsewhere. These include health departments, hospital and other medical facilities, private health and welfare agencies, and community planning groups. These organizations provide opportunities for observation and special studies, and members of their staffs are available to assist in the School's educational program. Administrative methods at local levels may be studied at first hand in some of these agencies in the Greater Boston Area.

The Institute of Laboratories of the Massachusetts Department of Public Health is engaged in a program of general interest, attracting visitors and students from various parts of the United States and from foreign countries. It not only performs a wide variety of standard bacteriological, immunological and chemical procedures,

## HARVARD UNIVERSITY

but is actively engaged in several research programs. Its Superintendent is a member of the School's Faculty. This close contact with one of the country's outstanding laboratories provides excellent opportunities for qualified students who wish to obtain intensive experience in many types of laboratory methods of particular pertinence to public health.

The clinical and laboratory facilities of the Lemuel Shattuck Hospital are available to students of the School. This hospital was built by the Department of Public Health of the Commonwealth of Massachusetts for the treatment and rehabilitation of patients with chronic diseases. Since the average duration of hospitalization is usually longer than that in general hospitals, an opportunity is afforded to study chronic disease problems not encountered in general hospitals. The training program, consultant rounds and professional staff appointments are under the aegis of the Deans of Boston University, Harvard and Tufts University Medical Schools, as well as the Harvard School of Public Health. Research laboratories at the Shattuck Hospital are engaged in studies of arthritis, hematology, pulmonary function, radioisotopes, cancer therapy and chronic renal and hepatic diseases.

## LIBRARIES

The library needs of the School of Public Health are served principally by the Francis A. Countway Library of Medicine, which opened its doors to readers in June 1965. The Countway Library, located at 10 Shattuck Street, combines the resources and services of the Harvard Medical Library and the Boston Medical Library. Among libraries serving medical and health-related schools, it is the largest in the country. Its recorded holdings number 410,000 volumes, and it receives 4,400 periodicals. The Countway Library is open:

8:00 a.m. to 11:30 p.m. weekdays

9:00 a.m. to 5:00 p.m. Saturdays

2:00 p.m. to 6:00 p.m. Sundays

In addition to its holdings of current books and periodicals, the Countway Library has extensive collections of historical materials,





The Countway Library of Medicine and its Periodical Room



## **HARVARD UNIVERSITY**

dating from the 15th Century. Its History of Medicine Department provides modern facilities for the use of these books and other rarities.

For the convenience of the several departments of the School, collections of books and journals are maintained within those departments.

All members of the University may borrow from the College Library at Cambridge. Messenger service is provided daily between the College Library, various other Harvard University Libraries, and the Countway Library.

The Boston Public Library issues cards to permanent and to temporary residents of Boston. Others may obtain cards upon payment of a small fee. Other libraries of the Boston area, notably those of the Massachusetts Institute of Technology, add to the total book and periodical resources available to students.

The librarian of the Countway Library is Ralph T. Esterquest, and Dr. Jean Mayer represents the School of Public Health on the Library Committee.

## **SHATTUCK INTERNATIONAL HOUSE**

An important facility offered by the Harvard School of Public Health is the Henry Lee Shattuck International House, the residence for students and their families. Located within walking distance from the School at 199, 203 and 207 Park Drive, Boston, this residence includes sixty-three remodeled individual apartments of one to four rooms—each with its own kitchenette, bath, and foyer. Leased for the academic year, September through June, these apartments are furnished except for linens and blankets, and the monthly rental includes heat, hot water, janitor service, and all utilities but telephone.

In addition the Shattuck International House provides a playroom and an outdoor playground for the children, a laundry room, a study room, and a recreation area which includes a library, music rooms, a kitchen equipped to prepare food for any academic community affairs, and a large meeting room. Here, under the spon-



sorship of faculty and students, are held informal gatherings and regularly planned events which offer many opportunities for the exchange of ideas and information about the culture, geography and social structure of the many countries represented in the House. Good equipment for showing films and colored slides is available.

The Shattuck International House since its opening in 1960 has fulfilled the hopes of the Faculty, alumni and friends of the School who visualized it as a residence of dignity and comfort for the students and as a congenial center for recreational and cultural activities.

About one hundred and fifty persons, including fifty children, from twenty to thirty countries reside in



the comfortable apartments of the International House. Approximately one half of the residents are American citizens.

Air-conditioned and fully equipped common rooms include a study room (below).



Each apartment has its own equipped kitchenette.





Meeting and dining facilities,  
lounges soundproofed music rooms



and a stately garden court offer  
opportunities for recreation.







# **TWO**

**ADMISSION AND DEGREES**





## *Application for Admission*

Applicants for admission to the School must submit the following material for consideration by the Committee on Admissions and Degrees: (1) completed application form; (2) transcripts of academic record at college, graduate school and/or professional school; (3) names of at least three people, well acquainted with the applicant's previous work, from whom the School may request letters of reference.

Applicants from countries in which the language of instruction is not English must satisfy the Committee on Admissions and Degrees as to their ability to speak, read, write and understand the English language competently. In order to profit from a program of graduate study, the applicant must have sufficient knowledge of English to enable him to understand lectures in English, to participate in seminar discussions and to write examinations. In the absence of sufficient evidence from the sponsoring agency and other sources, the School may request that the applicant take and pass satisfactorily the University of Michigan English Language Test. If, upon arrival at the School, a student's command of English is found to be inadequate, he may be required to take further instruction in English.

In addition to fulfilling the specific requirements for admission to the several degree programs, applicants must satisfy the Committee as to their scholastic ability and potentiality for profitable study at a graduate level. In all instances, the final judgment as to the admissibility of an applicant rests with the Committee on Admissions and Degrees.

Preference will be given to applicants under 40 years of age; applicants over 45 years of age may be considered for admission only under exceptional circumstances.

The School is unable to accept all who apply and are eligible for admission. Therefore, persons who wish to be considered for ad-

mission to the 1967-68 Class are urged to submit their applications by April 1, 1967. However, applications which are completed *by July 31, 1967*, will be considered, subject to availability of space.

Admission of a candidate for one academic year does not automatically admit him in a subsequent year; re-application must be considered on the candidate's own merits in the light of the particular circumstances which govern the decisions of the Committee on Admissions and Degrees.

All inquiries and communications regarding admission should be addressed to The Registrar, Harvard School of Public Health, 55 Shattuck Street, Boston, Massachusetts, 02115.

## *Living Expenses*

Experience has shown that it is difficult for a student to get the most out of his year at the School if he has to be unduly concerned about funds to meet his expenses. Living costs in the Boston area are higher than in most areas from which students come. Therefore, the School has adopted the policy stated below in regard to applicants for admission from outside the United States.

An applicant whose financial support is not guaranteed by an official U. S. agency or foundation must submit evidence satisfactory to the School that he will have sufficient funds available in U. S. currency to enable him to pay his expenses during the academic year. The minimum amount needed by a single person, in addition to travel, is \$4,100, to cover the cost of tuition (\$1,850) and living expenses of at least \$250 a month for nine months. If an applicant plans to bring his family, he must have at least \$900 more for his wife and \$450 for each dependent child, in addition to travel expense. Certification of adequate financial resources must be received by the School before the immigration form needed to obtain a visa to enter the U.S. can be issued to the student.



## *Courses of Study and Degrees*

### **MASTER OF PUBLIC HEALTH DEGREE**

#### **Requirements for Admission**

1. Applicants may be considered for admission as candidates for the Master of Public Health degree if they are graduates of approved schools of medicine or if they have similarly thorough preparation in the biological sciences.

2. Persons with these qualifications must satisfy the Committee on Admissions and Degrees as to their scholastic abilities and potentiality for profitable study at a graduate level.

#### **Requirements for the Degree**

1. One academic year must be spent in residence at the University. The student must complete successfully the required and elective courses to a minimum total of 40 credit units.

The first term of the Master of Public Health program consists



## HARVARD UNIVERSITY

of required courses providing basic information in the sciences relevant to public health and an understanding of principles and methods. The second term is devoted largely to courses elected by the student in consultation with his Faculty adviser.

2. All candidates for the degree are required to take the following courses, unless they can demonstrate equivalent preparation:

### FALL TERM

<i>Course and Title</i>	<i>Credit Units</i>
Principles of Biostatistics (Biostatistics 1a,b)	3.5
Principles of Epidemiology (Epidemiology 1a,b)	2.5
Provision of Health Services and Medical Care (Health Services Administration 1a,b)	4
Principles of Environmental Health (Environmental Health 1a,b)	4
Ecology and Epidemiology of Infectious Diseases (Microbiology and Tropical Public Health 1a,b)	4
The Human Community (Behavioral Sciences 1a)	1
Mental Health and Mental Illness (Behavioral Sciences 1b)	1
Public Health Nutrition (Nutrition 1a,b)	1
Population Growth and Fertility Control (Demography and Human Ecology 1a)	1

### SPRING TERM

History and Philosophy of Public Health (Interdepartmental Course 1.1c)	1
Public Health Policies (Interdepartmental Course 1.2c,d)	2

3. After the student has decided on a major field of interest, or has chosen a general program he may elect to enroll in one of the courses for department majors given during the second period of the fall term. This elective course continues during the spring term in some departments.

4. The required courses and the elective departmental course comprise the total program for the fall term. *A candidate for the degree of Master of Public Health may not elect any additional*



*courses during this term unless excused from one or more of the required courses.*

5. The balance of the Master of Public Health program in the spring term is devoted to elective courses, seminars and tutorial work, chosen by the student on the basis of his field of interest. These courses are described on pages 65-141. Certain courses in other graduate schools of Harvard University and in the Massachusetts Institute of Technology are open to full-time students in the Harvard School of Public Health.

6. No formal classes are scheduled during the one-week period from January 30 to February 4, 1967. This time is available to study data processing in the Department of Biostatistics and for supervised special studies or for field observations. All candidates for the Master of Public Health degree are required to register for work during this week under Biostatistics 13e or 14e, Course 17e (Tutorial) or Course 30e (Field Study). Opportunities available are listed under the various Departments. One unit of credit will be given for satisfactory completion of the week's assignment.

## **MASTER OF SCIENCE IN HYGIENE DEGREE**

**(With Designation of a Field of Concentration)**

This degree is granted on fulfillment of a program of advanced work in one of the basic disciplines of public health. The courses taken must form an integrated plan of study in one branch of knowledge and allied subjects.

### **Requirements for Admission**

Applicants may be considered for admission as candidates for the Master of Science in Hygiene degree, on the basis of a one-year or a two-year program, if they meet the requirements in one of the categories listed below. They must also satisfy the Committee on Admissions and Degrees and the department within which they choose to specialize as to their potentiality for successful study at a graduate level within the School.

### **One-year Program**

1. Applicants who are graduates of approved schools of medicine or who have a thorough preparation of a similar nature in the biological sciences.
2. Applicants who have a doctoral degree from an approved school in a discipline related to public health.
3. Applicants in public health specialties (social workers, nurses, health educators, nutritionists) who have obtained a master's degree with honor grades in their special fields and have had at least two years' acceptable experience in a public health activity.
4. Applicants in industrial hygiene or public health engineering who have a bachelor's degree with honor grades in physics, chemistry and engineering and who have a master's degree or equivalent graduate work with honor grades.

### **Two-year Program**

Applicants with a bachelor's degree obtained with honors in the natural sciences who wish to specialize in one of the laboratory sciences or statistics.

Under certain circumstances, a year of graduate work in another approved institution may be accepted as the first year of this program.

### **Requirements for the Degree**

1. The student must spend a minimum of one year in residence at the University and must complete successfully a program of at least 40 credit units. Candidates in the two-year program must obtain at least 80 credit units.
2. All candidates for the degree are required to take Biostatistics 1a,b and Epidemiology 1a,b, unless they can demonstrate equivalent preparation. Candidates who do not have a background in medicine or biology are required to take Biostatistics and Epidemiology 7a,b (see page 68). The remainder of the program is devoted to courses which may be prescribed by the department of concentration and to elective courses in the primary and related fields of

interest. These courses are described on pages 65–141. Courses offered by other Faculties of the University are also available.

3. No formal classes are scheduled during the one-week period from January 30 to February 4, 1967. This time is available to study data processing in the Department of Biostatistics and for supervised special studies or field observations. All candidates for the Master of Science in Hygiene degree are required to register for work during this week, under Biostatistics 13e, 14e, or Course 17e (Tutorial) or Course 30e (Field Study). Opportunities available are listed under the Departmental course offerings. One unit of credit is given for satisfactory completion of the week's assignment.

## MASTER OF INDUSTRIAL HEALTH

A program of courses leading to a Master of Industrial Health degree was established in 1949, in recognition of the need for post-graduate training in the public health disciplines which are relevant to the development of preventive medical programs in industry.

### Requirements for Admission

Candidates for this degree must be graduates of an acceptable school of medicine and must also satisfy the Committee on Admissions and Degrees as to their scholastic abilities and potentiality for profitable study at a graduate level. Students from the United States must have completed an internship of at least twelve months in a hospital approved by the American Medical Association.

### Requirements for the Degree

1. One academic year must be spent in residence at the University.
2. The student must complete successfully the required and elective courses to a minimum total of 40 credit units. All candidates for the degree are expected to take the following courses unless they can demonstrate equivalent preparation:

<i>Course</i>	<i>Credit units</i>
Biostatistics 1a,b	3.5
Epidemiology 1a,b	2.5

## HARVARD UNIVERSITY

<i>Course</i>	<i>Credit Units</i>
Environmental Health 1a,b	4
Environmental Health 3a,b (Radioactivity and Radiation Protection)	4
Industrial Hygiene 3c,d (Basic Problems in Occupational Health and Industrial Environments)	6
Total	<hr/> 20

In addition, the student may select from the general curriculum courses of interest to him, or do special work subject to approval of the Heads of the Departments of Industrial Hygiene or Physiology.

3. No formal classes are scheduled during the one-week period from January 30 to February 4, 1967. This time is available to study data processing in the Department of Biostatistics and for supervised special studies or field observations. All candidates for the Master of Industrial Health degree are required to register for work during this week, under Biostatistics 13e, 14e, or Course 17e (Tutorial) or Course 30e (Field Study). Opportunities available are listed under the Departmental course offerings. One unit of credit will be given for satisfactory completion of the week's assignment.

## DOCTOR OF PUBLIC HEALTH

For the degree of Doctor of Public Health the student must complete an approved program of independent and original investigation in a special field and must present the results of this research in an acceptable thesis.

### Requirements for Admission

1. An applicant for admission to candidacy for this degree must be either (a) a graduate of an approved school of medicine, dental medicine or veterinary medicine, or (b) the holder of another doctoral degree in one of the basic sciences related to public health. In exceptional cases, an individual lacking a previous doctoral degree may be admitted if he has displayed outstanding ability in previous academic work and in practical public health experience.



2. The applicant must hold the degree of Master of Public Health or its equivalent from an approved institution and must have demonstrated potential ability to undertake original investigation in a special field.
3. Admission to doctoral candidacy is considered provisional until the candidate has passed the oral qualifying examination.

## **DOCTOR OF SCIENCE IN HYGIENE**

(With Designation of a Field of Concentration)

This degree is granted on successful completion of a program of independent and original research in one of the basic disciplines of public health, and the presentation of this research in an acceptable thesis.

### **Requirements for Admission**

Candidates for the degree of Doctor of Science in Hygiene must hold the degree of Master of Science in Hygiene or its equivalent and must indicate ability to undertake original investigation in a special field.

Admission to doctoral candidacy is considered provisional until the candidate has passed the oral qualifying examination.

## **REQUIREMENTS FOR DOCTORAL DEGREES**

### **Residence**

The student is required to complete a minimum of one academic year in residence. However, the required work and preparation of an acceptable thesis normally require two full years and frequently longer.

### **Doctoral Program Adviser**

After the student enrolls in the School as a provisional doctoral candidate, a Doctoral Program Adviser is appointed by the Department of concentration. This Adviser keeps the student informed of all procedures and requirements for the degree, advises him about proper courses to be taken, decides, together with the De-



partment, when the student is prepared to take the qualifying examination, and supervises the thesis work.

### **Foreign Language Requirement**

The candidate must possess a reading knowledge of two languages, other than his native tongue, which will enable him to make use of the literature pertinent to his professional interests. Usually these languages are chosen from the following four — German, French, Russian and English — with the restriction that the student may not utilize the major language of scientific communication in his native country in meeting the requirements. A language other than the four listed above, which meets the special needs of the candidate's research program may be substituted with the consent of the Department of concentration and the Committee on Admissions and Degrees. One language examination must be passed before the candidate is permitted to take the qualifying examination. The second language examination must be passed before the appointment of the Readers of the Thesis. The candidate is urged to satisfy the language requirements as early as possible.

### **Qualifying Examination**

When the Adviser and the Department judge that the candidate is prepared, an oral qualifying examination is conducted by Special Examiners, who examine in depth in the area of the candidate's general academic knowledge, his major interest, and related fields. This examination should be taken within six months, but no later than one year, after admission as a provisional doctoral candidate.

### **Evaluation of Candidate's Progress**

After the candidate has passed the qualifying examination, two Faculty members are appointed to aid the Adviser in the periodic evaluation of the student's progress.

### **Deadline Dates for Thesis**

After the Adviser and Department deem the thesis completed, it shall be typed in final form. Three unbound copies must be deposited

in the Dean's Office *before January first*, for degrees to be awarded at midyear, and *before April fifteenth* for degrees to be awarded in June. The thesis must be accompanied by 100 copies of a summary not exceeding 1200 words in length, which shall indicate clearly the purpose, methods, and results of the investigation.

### **Acceptance of the Thesis and Final Examination**

When the thesis is submitted, three Readers are appointed to determine if it is acceptable. If it is approved, a final examination is given at which the student defends his thesis before members of the Faculty, including the Readers. Ordinarily, the thesis must be approved within five years of the date of the qualifying examination.

A detailed statement of procedures and requirements for the doctoral program and for the preparation of the thesis may be obtained from the Registrar after the student has been admitted to provisional candidacy for the degree.

## *Residency Programs*

The School already offers, or is planning to offer, training programs leading to certification by the American Board of Preventive Medicine in the following areas:

Occupational Medicine

Aerospace Medicine

General Preventive Medicine, in the specialty areas of

Epidemiology

International Health

Health Services Administration

Residencies in Public Health are also available through the Massachusetts Department of Public Health.

A residency program in Dental Public Health leading to certification by the American Board of Dental Public Health is available through the School of Dental Medicine in cooperation with the School of Public Health and the Massachusetts Department of Public Health.

These programs are three years in length and consist of one or two years of study leading to the graduate degree, Master of Public Health, or Master of Science in Hygiene, and one or two years of more advanced work including supervised experience which may or may not be part of a doctoral program. The third year may be devoted to training in an approved industry, organization, or institution consistent with the speciality area. In the case of the specialty of "Public Health" the second and third years can be taken under the auspices of the Massachusetts Department of Public Health with the School of Public Health formally serving as a resource to the resident and to the State residency training program.

Further details on the residency programs, including availability of financial support, can be obtained through the Departments of the School concerned or through the Massachusetts Department of Public Health for the residency in Public Health.

## *Special Students*

Subject to availability of space, the School may accept a few students, on a full-time or a part-time basis, who are not degree candidates, but who are interested in taking one or more courses in a special field. Procedures and requirements for the admission of such students are the same as for degree candidates. Special students who later wish to be admitted to degree candidacy will be considered on the same basis as other applicants for admission. Admission as a special student carries with it no commitment to accept the applicant as a degree candidate.

## *Degrees in Engineering*

Graduates of engineering colleges or scientific schools of recognized standing who are interested in the environmental health aspects of public health may be admitted to the Division of Engineering and Applied Physics of the Graduate School of Arts and Sciences as candidates for the degree of Master of Science or Doctor of Philosophy. They may elect appropriate courses in the School of Public Health as a part of the program for these degrees.

For further information write to the Committee on Admissions, Graduate School of Arts and Sciences, Holyoke Center, 75 Mt. Auburn Street, Cambridge, Massachusetts, 02138.







<< President Pusey in the academic procession  
on Commencement Day

# THREE

## CONTENT OF COURSES



## Department of Biostatistics

ROBERT B. REED, A.B., A.M., PH.D., A.M. (hon.), Professor of Biostatistics and Head of the Department

JANE WORCESTER, A.B., DR.P.H., Professor of Biostatistics and Epidemiology

JACOB J. FELDMAN, PH.D., Associate Professor of Biostatistics

MARGARET E. DROLETTE, A.B., M.P.H., Assistant Professor of Biostatistics

DAVID M. HEER, A.B., A.M., PH.D., Assistant Professor of Biostatistics and Demography

OLLI S. MIETTINEN, M.D., M.P.H., Assistant Professor of Epidemiology and Biostatistics

\*PAUL M. DENSEN, A.B., S.D., Visiting Lecturer on Biostatistics; *Deputy Commissioner, New York City Department of Health*

MARGARET B. HOFF, A.B., S.M., Assistant in Biostatistics and Maternal and Child Health

MARY L. NEW, S.B., M.P.H., Assistant in Biostatistics

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ANTHONY F. BARTHOLOMAY, A.B., A.M., S.D. IN HYG., *Assistant Professor of Mathematical Biology, Department of Medicine, Harvard Medical School*

The teaching aims of the Department may be divided very generally into three categories:

First, it is essential for workers in all branches of public health to be able to draw justified conclusions from numerical data and to base logical action on these conclusions. This applies to the administrator who must evaluate problems and the results of his activities, as well as to the epidemiologist and the research worker who must apply statistical techniques to their laboratory and field problems. The required course in Biostatistics is therefore designed to give a minimum command of simple statistical methodology to all students.

Second, it is essential for field and laboratory researchers to be able to use statistical methods in planning and analyzing their experiments and problems. Elective courses are designed to provide an introduction to methodology in this area. These courses are adapted to the needs of students of this School, many of whom have broad backgrounds in biological sciences while few have extensive preparation in mathematics. A minimum of mathematical exposition is therefore included in courses intended for students in these categories. Instead the emphasis is on understanding the statistical procedures and the ability to carry out indicated analyses effectively.

Third, there is a smaller group of students particularly interested in pur-

\* Part-time in the School of Public Health.

## HARVARD UNIVERSITY

suing further work along mathematical lines. Their requirements are fulfilled, on the one hand, by the provision of advanced and seminar courses in the Department; on the other, by the offerings of the Department of Statistics in the Graduate School of Arts and Sciences. Students with mathematical backgrounds who are working in biology, or medical scientists with an understanding of basic mathematics, will be interested in the teaching and research program in Mathematical Biology offered by Dr. Bartholomay at the Medical School. Properly qualified students of the School of Public Health may arrange for instruction in this area of knowledge.

Training in the use of data processing equipment is available in the Data Processing Center operated by the Department. This Center is equipped with an IBM 1620 Computer and basic punch card machines, including a 101 Statistical Sorter. The University Computer Center, located in Cambridge and equipped with an IBM 7094 Computer, also provides an opportunity to study computer techniques.

Candidates for the Master of Public Health degree who elect to concentrate in Biostatistics are normally expected to take the following courses in addition to satisfying the formal course requirements for the degree:

Biostatistics 2b,c,d

Biostatistics 3c,d

Biostatistics and Behavioral Sciences 4c,d

### **Biostatistics 1a,b. Principles of Biostatistics**

Lectures and discussions. *Tuesdays and Thursdays, 8:30-9:30, first and second periods.*

Laboratory. *Thursdays or Fridays, 1:30-4:30, first and second periods.* Staff of the Department.

Credit 3 units.

Required of Master of Public Health and Master of Science in Hygiene candidates.

Lectures, discussions and laboratory exercises introduce the student to demographic concepts: the structure of the population and the use of the life table; the nature and composition of rates and their use from administrative and epidemiological points of view. The course forms an introduction to the theory of measurements and distributions, including the testing of significance of differences and the interaction of variables. Finally, the student is introduced to basic concepts of probability and association, sampling techniques and construction of controlled experiments such as clinical trials.

### **Biostatistics 2b,c,d. Design of Investigations**

Seminars. *Mondays, 1:30-3:30, second, third, and fourth periods.* Staff of the Department.

Credit 3 units.

This course is for students with a major interest in biostatistics. Participants select a biostatistical problem in apparent need of investigation, and prepare and present for group discussion a summary of the present status of knowledge of the problem and the design of a study directed towards advancement of present knowledge. Given in conjunction with Epidemiology 2b,c,d.

Enrollment is subject to the approval of the Head of the Department.

### **Biostatistics 3c,d. Statistical Methods in Research**

Lectures, discussions and laboratory. *Two three-hour sessions each week, third and fourth periods.* Dr. REED and Dr. WORCESTER.

Credit 4 units.

This course, a continuation of Biostatistics 1a,b, introduces the student to technical statistical procedures important in problems of laboratory and field research. Topics included are further considerations of probability and correlation, together with an introduction to procedures used in the planning of experiments, including variance analysis, non-parametric methods, dosage response and maximum likelihood. Statistical techniques introduced in advanced courses in epidemiology will be amplified and supplemented.

Prerequisites: Basic preparation in statistics and epidemiology.

### **Biostatistics 4c,d. Mathematical Foundations of Biostatistics**

Lectures. *One two-hour session each week, third and fourth periods.* Assistant Professor DROLETTE.

Credit 2 units.

The material covered includes mathematical descriptions of commonly used distributions, standard procedures for estimating the moments of a distribution and mathematical foundations of statistical inference, including the Neyman-Pearson lemma, the likelihood ratio, the central limit theorem and power.

Prerequisite: A course in elementary calculus.

### **Biostatistics and Behavioral Sciences 6c,d. Research Methods in Community Health**

Lectures and discussions. *Two two-hour sessions each week, third and fourth periods.* Dr. REED, Dr. FELDMAN and Staff of the Behavioral Sciences Department.

Credit 4 units.

This elective course, offered by members of the Biostatistics and Behavioral Sciences Departments, is intended primarily for doctoral candidates and other



## HARVARD UNIVERSITY

advanced students who require specialized preparation to conduct or administer scientific research on social and community aspects of health, health behavior and health organization. The merits of alternative research designs are covered by means of lectures, discussions of current research projects, and presentations of students' own research plans. Instruction covers a range of methods and techniques including survey methods, case and longitudinal studies, as well as relevant statistical techniques, methods of constructing and administering interviews, and other methods of data collection and analysis.

Enrollment is limited and is subject to the approval of the Instructor.

### **Biostatistics and Epidemiology 7a,b. Principles**

Lectures and discussions. *Wednesdays, 3:30-4:30, first and second periods.* Dr. WORCESTER, Dr. BELL and Dr. FEINLEIB.

Credit 1 unit.

Biostatistics and Epidemiology are required of Master of Science in Hygiene candidates. This requirement is met by enrollment in Biostatistics 1a,b (3 units) and Epidemiology 1a,b (2.5 units). In addition, those candidates without a background in medicine or biology must take Biostatistics and Epidemiology 7a,b (1 unit) which meets one hour each week in the fall term. This additional session provides supplementary information and an opportunity to discuss the material presented in the other two courses.

### **Biostatistics 10c or d. Advanced Topics in Biostatistics**

Lectures. *One two-hour session each week, third or fourth periods.* Dr. REED.

Credit 1 unit.

The subject matter in this course varies from year to year. It deals intensively with a topic touched upon in Biostatistics 1a,b or 3c,d. The topic for 1966-67 is the  $2 \times 2 \times 2 \times 2$  table.

The course is intended for advanced students and departmental majors.

### **Biostatistics 11a,b,c,d. Teaching of Biostatistics**

*Time and credit to be arranged.* Staff of the Department.

This course is primarily used for students majoring in Biostatistics who act as laboratory instructors in Biostatistics 1a,b as part of their training. It may also be used for other teaching experiences.

### **Biostatistics 12a,b,c,d. Biostatistical Consultation**

*Time and credit to be arranged.* Staff of the Department.

This course provides an opportunity for students majoring in Biostatistics to participate in the consulting work carried on by the Department faculty.

**Biostatistics 13e,f. Introduction to Data Processing**

*One full week is offered twice a year, January 30 — February 4, 1967 or June 5 — 10. Staff of the Data Processing Center.*

Opportunity is provided for studying the use of the equipment of the School's Data Processing Center.

**Biostatistics 14e,f. Introduction to Computer Programing**

*One full week is offered twice a year, January 30 — February 4, 1967 or June 5 — 10. Staff of the Data Processing Center.*

Emphasis is placed on instruction in Fortran programing and in the use of the IBM 1620 computer.

**Biostatistics 15a,b,c,d. Advanced Data Processing**

*Individual work may be arranged to suit the need of the student. Staff of the Data Processing Center.*

Prerequisite: Biostatistics 13 and/or Biostatistics 14, or equivalent.

**Biostatistics 17a,b,c,d,e. Tutorial Program**

*Time and credit to be arranged. Staff of the Department.*

An opportunity for tutorial work at master's level is given interested students. This involves not only work in statistical fields, but can include problems arising in the course of special programs in other departments. Schedules and credit may therefore be arranged jointly with such other departments.

**Biostatistics 20. Research**

Individual guided research at doctoral level, for candidates for the Doctor of Public Health, Doctor of Science in Hygiene or other doctoral degrees. The work may be part of the program for a doctorate in this Department or may be integrated with doctoral research in other departments.

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Students may register for Biostatistics 11, Biostatistics 12, Biostatistics 15, Biostatistics 17 or Biostatistics 20 for a maximum of 12 credit units in the summer term.

## Department of Epidemiology

BRIAN MACMAHON, M.D., PH.D., D.P.H., S.M. IN HYG., Professor of Epidemiology and Head of the Department

JANE WORCESTER, A.B., DR.P.H., Professor of Biostatistics and Epidemiology

HERBERT L. LEY, JR., M.D., M.P.H., Associate Professor of Epidemiology and Microbiology

\*SAMUEL G. MCCLELLAN, A.B., M.D., M.P.H., Lecturer on Applied Epidemiology

\*THOMAS F. PUGH, M.D., M.P.H., Associate Professor of Applied Epidemiology; *Director, Division of Medical Statistics and Research, Massachusetts Department of Mental Health*

THEODOR ABELIN, M.D., M.P.H., Assistant Professor of Epidemiology

MANNING FEINLEIB, A.B., M.D., M.P.H., DR.P.H., Assistant Professor of Epidemiology

OLLI S. MIETTINEN, M.D., M.P.H., Assistant Professor of Epidemiology and Biostatistics

ASCHER J. SEGALL, M.D., M.P.H., DR.P.H., Assistant Professor of Epidemiology

\*ROBERT W. MILLER, A.B., M.D., M.P.H., DR.P.H., Visiting Lecturer on Epidemiology; *Chief, Epidemiology Branch, National Cancer Institute*

\*RALPH S. PAFFENBARGER, JR., A.B., B.M., M.D., DR.P.H., Lecturer on Epidemiology; *Chief, Field Epidemiological Research Section, National Heart Institute, Framingham*

\*MORRIS SIEGEL, M.D., M.P.H., Visiting Lecturer on Epidemiology; *Professor of Environmental Medicine and Community Health, State University of New York Downstate Medical Center*

CHARLES NEAVE, A.B., M.D., M.P.H., Teaching Fellow in Epidemiology

WEN-PING TSENG, M.D., Senior Research Fellow in Epidemiology

STELLA B. YEN, M.P.H., Research Fellow in Epidemiology

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HERMANN LISCO, M.D., *Lecturer on Pathology, Harvard Medical School*

MARISE S. GOTTLIEB, A.B., M.D., M.P.H., *Research Fellow in Medicine, Harvard Medical School*

\* Part-time in the School of Public Health.

The major objective of the Department of Epidemiology is to provide opportunities for training and experience in the application of epidemiologic research methods to the investigation of diseases of unknown etiology. Emphasis is on the cardiovascular and mental disorders, the malignant neoplasms, abnormalities of reproduction and development, and other major diseases for which preventive measures are still unknown or inadequate.

A one-year research-training program leads to the degree of Master of Science in Hygiene in the field of Epidemiology. This program usually includes the following courses: Epidemiology 1a,b, 2b,c,d, 3c,d and 4a,b; Biostatistics 1a,b, 3c,d and 13c; and Epidemiology and Biostatistics 6c,d—a total of 20 credit units. The remainder of the credits required for the degree may be taken as additional formal courses in areas of special interest, or as supervised research (Epidemiology 17a,b,c,d).

For qualified students the period of research training may be extended by admission to either of the doctoral programs offered by the School, by admission to special student status, or through other individual arrangements. During the second and subsequent years of training, students whose first year was in the Master of Public Health program are expected to enroll in any of the above courses which were not taken in their first year. Other courses in this or other schools of the University may also be elected. However, most of the training period beyond the master's degree is occupied by the completion of a research project and, in the case of doctoral candidates, preparation of a thesis. Doctoral candidates must plan at least two years in residence beyond completion of the master's degree.

Epidemiology 1a,b is required for students in the general Master of Public Health program of the school. Epidemiology 3c,d, 5c and 2b,c,d are departmental courses that can also be considered by Master of Public Health candidates as components of the elective part of that program.

A three-year residency in the Department of Epidemiology has been approved as satisfying residency requirements of the American Board of Preventive Medicine for certification in General Preventive Medicine. Requirements of the approved residency and of the School's degree programs may be satisfied simultaneously.

Fellowships for research training programs are provided in a U.S. Public Health Service training grant to the Department. The Public Health Service also has a program of traineeship grants for support of residents in approved preventive medicine residencies. Traineeships from both sources are restricted to U.S. citizens or physicians who have been admitted to the United States for permanent residence. In both cases, applications should be submitted through the Department of Epidemiology.



## HARVARD UNIVERSITY

### Epidemiology 1a,b. Principles of Epidemiology

Lectures and discussions. *Tuesdays and Thursdays, 9:30-10:30, first period; Tuesdays, 9:30-11:30, Thursdays, 9:30-10:30, second period.* Dr. MACMAHON and Dr. ABELIN.

Credit 2.5 units.

Required of all Masters' degree candidates.

Lectures and discussions on the principles, purposes and methods of epidemiology: descriptive and analytic epidemiology; case history, cohort, and experimental studies; measurement of disease frequency, and comparison of risks in different types of investigation. Principles are illustrated by reference to classic epidemiologic investigations of infectious and non-infectious diseases.

### Epidemiology 2b,c,d. Design of Investigations

Seminars. *Mondays 1:30-3:30, second, third, and fourth periods.* Staff of the Department.

Credit 3 units.

This course is for students with a major interest in epidemiology. Participants select an epidemiologic problem in apparent need of investigation, and prepare and present for group discussion a summary of the present status of knowledge of the problem and the design of a study directed towards advancement of present knowledge. Given in conjunction with Biostatistics 2b,c,d.

Enrollment is subject to the approval of the Head of the Department.

### Epidemiology 3c,d. Epidemiology of Non-Infectious Diseases

Lectures. *Two one-hour sessions each week, third period; one two-hour session each week, and one one-hour session each week, fourth period.* Dr. MACMAHON and Staff of the Department.

Credit 2.5 units.

This course is designed to serve both Master of Public Health and Master of Science in Hygiene candidates.

A systematic review of existing knowledge of the epidemiology of diseases of unknown etiology or associated with etiologic factors which are not at present known to be of infectious nature. Emphasis is on the more common conditions, including the degenerative and malignant diseases. Attention is given to the methodologic difficulties associated with the epidemiologic investigation of chronic diseases.



**Epidemiology 4a,b. Human Heredity**

Lectures. *Two one-hour sessions each week, first and second periods.* Dr. FEINLEIB.

Credit 2 units.

Lectures on the methodology of investigating problems of human heredity and on the current state of knowledge of certain specific areas in this field. Introductory lectures review the principles of classical genetic theory but emphasis is on concepts and methodology particularly relevant to investigations on man.

**Epidemiology and Microbiology 5c. Epidemiologic Problems in Infectious Diseases**

Conferences, seminars, laboratory exercises. *Two two-hour sessions each week, third period.* Dr. LEY and Staffs of the Departments.

Credit 2 units.

This course, given by the staffs of the Departments of Microbiology, Epidemiology and Tropical Public Health, provides experience in solving epidemiologic problems in communicable diseases.

**Epidemiology and Biostatistics 6c,d. Research Methods in Epidemiology**

Lectures. *One two-hour session each week, third and fourth periods.* Dr. WORCESTER and Staffs of the Departments of Epidemiology and Biostatistics.

Credit 2 units.

Primarily for Master of Science in Hygiene and doctoral candidates in Epidemiology or Biostatistics.

This course is concerned with statistical and other problems commonly encountered in epidemiologic research. Examples include assessment of data quality, misclassification, nonresponse, population sampling, matching, and analytic techniques for birth order effects, time-space clusters, cyclical variations, and measurement of survival.

Prerequisite: Enrollment in Biostatistics 3c,d.

**Biostatistics and Epidemiology 7a,b. Principles**

Lectures and discussions. *Wednesdays, 3:30-4:30, first and second periods.* Dr. WORCESTER, Dr. BELL and Dr. FEINLEIB.

Credit 1 unit.

Biostatistics and Epidemiology are required of Master of Science in Hygiene candidates. This requirement is met by enrollment in Biostatistics 1a,b (3 units) and Epidemiology 1a,b (2.5 units). In addition, those candidates

## **HARVARD UNIVERSITY**

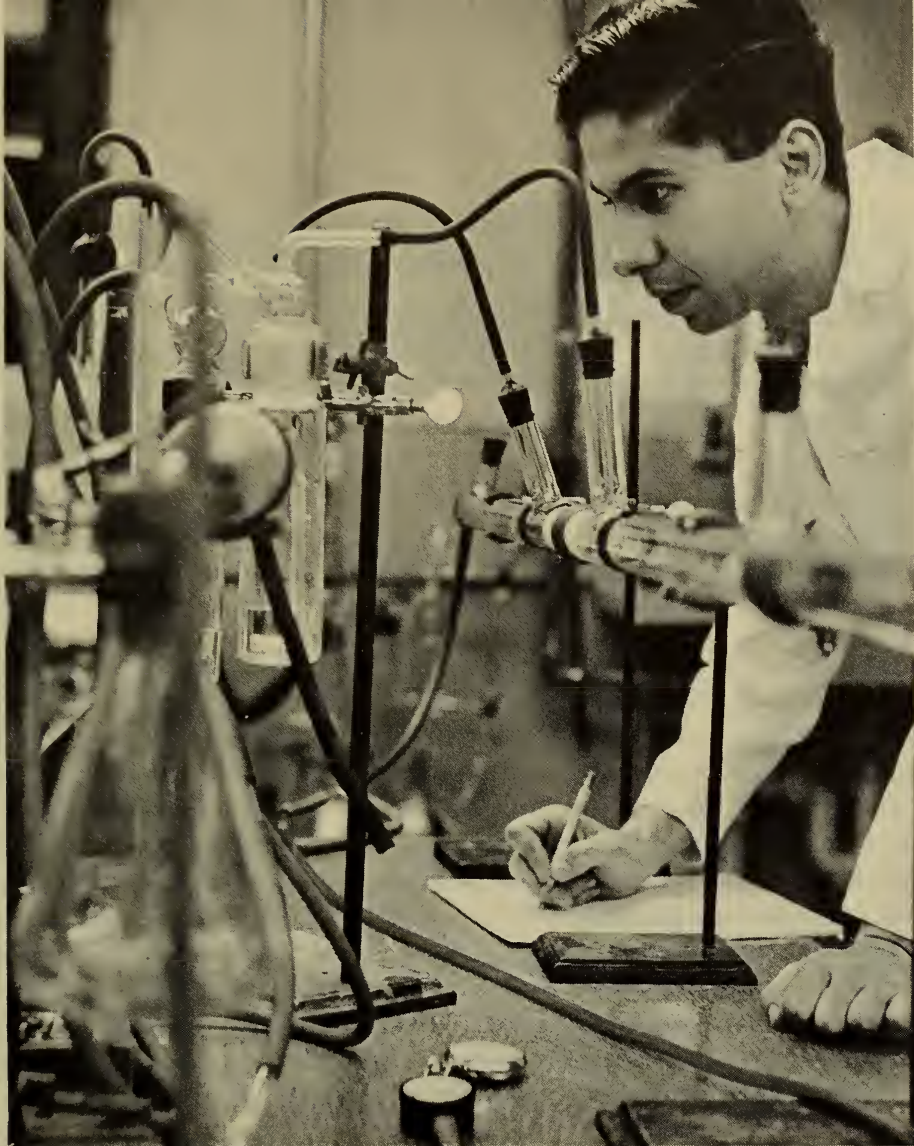
without a background in medicine or biology must take Biostatistics and Epidemiology 7a,b (1 unit) which meets one hour each week in the fall term. This additional session provides supplementary information and an opportunity to discuss the material presented in the other two courses.

### **Epidemiology 17. Introduction to Research**

Participation in departmental research in close association with a staff member. Time and credit are to be arranged with the Head of the Department.

### **Epidemiology 20. Research**

Research for doctoral candidates.



## *The Kresge Center for Environmental Health*

**James L. Whittenberger, S.B., M.D., A.M., (hon.), Director**  
**Dade W. Moeller, S.B., S.M., Ph.D., Associate Director**

This Center is based primarily at the School of Public Health and includes research and educational programs of the Departments of Industrial Hygiene, Physiology, and Sanitary Engineering, and environmental health-related activities in other parts of the University.

Cutting across administrative boundaries are interdisciplinary programs in several of the component fields of environmental health; these currently include the following:

- I. Aerospace Health and Safety

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2. Air Pollution Effects and Control
3. Environmental Biology
4. Environmental Toxicology
5. Human Factors — Accident Prevention
6. Industrial Hygiene
7. Occupational Medicine
8. Radiological Health
9. Respiratory Physiology
10. Sanitary Engineering
11. Solid Waste Disposal
12. Water and Soil Chemistry
13. Water Resource Engineering

In addition to these programs, the Center encourages the development of individual plans of study which extend to other parts of Harvard University where courses have relevance to environmental health; for example, in city and regional planning and public administration. The Center also promotes the development of seminar courses which cross disciplinary boundaries.

Several degree programs are available in environmental health; the formal requirements are described in other sections of the catalogue. In general, students interested in problems of water quality and water resources enroll for a Master of Science or Ph.D. program in the Division of Engineering and Applied Physics of the Graduate School of Arts and Sciences in Cambridge.

Students interested in such fields as air quality, industrial hygiene, radiological health, and toxicology ordinarily enroll in a Master of Science in Hygiene or Doctor of Science in Hygiene program at the School of Public Health. Physicians are eligible for any of the degrees offered by the School of Public Health.

Additional information is given in the departmental listings.

## Center Courses

### Environmental Health 1a,b. Principles of Environmental Health

Lectures and demonstrations. *Mondays and Fridays, 8:30-9:30; Tuesdays, 1:30-3:30, first and second periods.* Dr. WHITTENBERGER and Staff of the Center.

Credit 4 units.

This course is required of Master of Public Health and Master of Industrial Health candidates and is elective for other students.

Environmental health problems are considered primarily from two points of view:



1. The state of knowledge concerning the biological effects of physical, chemical, and biological environments, including pollution. Direct effects on health, as well as other consequences of concern to man, are dealt with.

2. The measurement of environmental quality, and the selection of methods for controlling undesirable or potentially harmful attributes of the environment. The applications of economic analysis and decision theory to environmental systems are developed.

Specific topics include water supply and pollution, solid waste problems, air pollution, public health aspects of ionizing radiation, food sanitation, and interrelationships of the environmental problems which beset a highly urbanized and technologically developed society.

### **Environmental Health 2b,c,d. Aviation Health and Safety**

Seminars. *Mondays, 1:30-3:30, second, third and fourth periods.* Dr. McFARLAND.

Credit 3 units.

The purpose of these seminars is to integrate the work in the basic courses of public health and preventive medicine with the specialized problems of aviation health and safety. Lectures and discussions are arranged throughout the year, led by the students, the Instructor, and various biological and medical specialists in the University. Visiting lecturers from other universities and research centers also participate in the seminar.

Enrollment is subject to the approval of the Instructor.

### **Environmental Health 3a,b. Introduction to Radioactivity and Radiation Protection**

Lectures, laboratories, and field trips. *Mondays, 1:30-5:30; Wednesdays, 3:30-4:30, first and second periods.* Dr. SHAPIRO and Dr. REIST.

Credit 4 units.

This course is an introduction to the health and safety problems accompanying the use of sources of nuclear radiations. Laboratory exercises provide an introduction to radiation sources, measuring techniques and the safe use of radioisotopes. Lecture topics include the elements of radioactivity; interaction of radiations with matter; calculation of radiation dose rates and shielding; neutron activation; radiation protection standards; major sources of population exposure including background radiation, medical X-rays, and fallout from nuclear detonations; radiation protection procedures.

### **Environmental Health 4a,b. Problems in Radiation Dosimetry**

Lectures. *Tuesdays and Thursdays, 1:30-2:30, first and second periods; laboratory, Thursdays, 2:30-5:30, first period.* Dr. SHAPIRO.



## HARVARD UNIVERSITY

Credit 3 units.

This course deals with the experimental and theoretical methods of evaluating radiation fields and determining radiation dose rates. Special dosimetry problems for study in the laboratory are selected from the fields of health physics, nuclear engineering, and nuclear medicine.

Prerequisite: Environmental Health 3a,b. It is also recommended that Industrial Hygiene 7c,d, Radiation Protection Engineering and Physiology 7c,d, Radiation Biology be taken before this course.

### Environmental Health 5c,d. Occupational Medical Seminars

Seminars, Lemuel Shattuck Hospital. *One two-hour session each week, third and fourth periods.* Dr. TYLER.

Credit 2 units.

The seminars emphasize the effect that non-occupational disease may have on the working capacity of the individual, the criteria for returning such an individual to work, and the rehabilitation program involved.

The seminars are limited to physicians and are not offered if less than four enroll.

### Environmental Health 6c,d. Occupational Medical Clinics

Clinics, Massachusetts General Hospital. *One two-hour session each week, third and fourth periods.* Instructor to be announced.

Credit 2 units.

To be omitted in 1966-67.

These clinics are concerned with diseases due to occupation, such as silicosis, beryllium intoxication, coal miner's pneumoconiosis, and lead poisoning. Special clinics are held in ophthalmology and dermatology.

The clinics are limited to physicians and are not offered if less than four enroll.

### Environmental Health 8c,8d. Human Factors in Occupational Performance and Safety

Lectures and demonstrations. *One two-hour session each week, third period; one two-hour session each week, fourth period.* Dr. McFARLAND.

Credit 1 unit in each period.

In the third period, the lectures and discussions emphasize the application of experimental psychology, anthropology, and biotechnology to the problems of occupational performance and adjustment. Consideration is given to the matching of psychological and physical abilities to job requirements. Emphasis is placed on the importance of designing equipment and work

practices in terms of human capabilities and limitations, including those related to fatigue, aging, and environmental stress. In the fourth period the lectures and seminars explore interdisciplinary methods in the analysis and prevention of accidents and injuries. While the major emphasis is on occupational safety, the prevention of other types of accidents is also included.

With the approval of the Instructor, either period may be taken separately.

#### **Environmental Health 9d. Occupational Medicine**

Lectures. *Two two-hour sessions each week, fourth period.* Dr. FERRIS and Dr. WILKINS.

Credit 2 units.

To be omitted in 1966-67.

The topics in this course include the administration and organization of occupational medical departments, physical examinations, rehabilitation, counselling, and medico-legal problems. Guest lecturers present problems associated with specific industries. The course is not offered if less than four enroll.

#### **Environmental Health 10c,d. Community Air Pollution**

Lectures, demonstrations, and seminars. *One two-hour session each week, third and fourth periods.* Dr. FIRST and Staff of the Center.

Credit 2 units.

This lecture and seminar course is designed for engineers, chemists, and physicians interested in air pollution control. It covers micrometeorology and its relation to the dissemination of pollutants in the atmosphere; measurement and control of community air pollution, air quality standards, health effects of air pollution, damage to animals, plants, and property; community and site surveys, and the nature and quantity of atmospheric emissions from industry, vehicles, and combustion sources including those used for solid waste disposal.

#### **Environmental Health 11c,d. Operations Research in Environmental Health Engineering**

Lectures and computer exercises. *Three hours each week, third and fourth periods.* Dr. HARRINGTON.

Credit 3 units.

This course is an introduction to the concepts and techniques of operations research, applied to problems of environmental health sciences and engineering. Topics include the following: several interrelated mathematical techniques of optimization — Lagrangian methods, steepest decent, linear, nonlinear and dynamic programming, approximation theory; systems analysis of air and water

## **HARVARD UNIVERSITY**

treatment processes; applications of queueing theory, Markov processes, and statistical decision theory; graph theoretic approach to solid wastes disposal and other transportation-type problems.

Prerequisite: Mathematics 20b, or its equivalent, is desirable.

Enrollment is subject to the approval of the Instructor.

### **Environmental Health 30e. Field Work**

Credit 1 unit.

A week of supervised field observation is offered from January 30 to February 4, 1967. Students may choose appropriate visits to medical or industrial hygiene departments of industries, airports, and other agencies which have operations or research in the field of environmental health.

The following course in the Graduate School of Design is open to properly qualified students in the School of Public Health:

### **Planning 6-2b. Urban Environmental Service Systems**

Seminar. Half course (spring term). Hours to be arranged. Assistant Professors HARRINGTON and COLE.

This course undertakes investigations into problems of planning for environmental services within urban regions. A systems analysis approach, incorporating computer methods, is followed whenever practicable. The interrelated problems of land use, urban form and function, and the provision of environmental services are emphasized. Topics include urban-planning aspects of solid and liquid waste collection and disposal, public water supply and distribution, environmental pollution, and electric power generation and distribution. Governmental mechanisms for planning environmental systems investment and regulation are explored, together with conservation and quality-control legislation.

## Department of Industrial Hygiene

JAMES L. WHITTENBERGER, S.B., M.D., A.M. (hon.), James Stevens Simmons Professor of Public Health, Professor of Physiology *and* Acting Head of the Department

\*MELVIN W. FIRST, S.B., S.M., S.D., Associate Professor of Applied Industrial Hygiene

\*GEORGE F. WILKINS, A.B., M.D., Associate Clinical Professor of Occupational Medicine; *Medical Director, New England Telephone Company*

DADE W. MOELLER, S.B., S.M., PH.D., Lecturer on Radiological Health *and* Associate Director, Kresge Center for Environmental Health

†WILLIAM A. BURGESS, S.B. IN MECH.ENG., S.M., Assistant Professor of Environmental Health and Safety Engineering; *Associate in Environmental Health and Safety, University Health Services*

PARKER REIST, S.B., S.M., S.M. IN HYG., S.D. IN HYG., Assistant Professor of Environmental Health Engineering

†JACOB SHAPIRO, S.B., S.M., PH.D., Assistant Professor of Biophysics in Environmental Hygiene; *Radiological Health and Safety Engineer, University Health Services*

FREDERICK J. VILES, JR., S.B., S.M., Research Associate *and* Lecturer on Industrial Hygiene

\*JAMES M. AUSTIN, B.A., M.A., S.D., Visiting Lecturer on Meteorology and Air Pollution; *Associate Professor of Meteorology, Massachusetts Institute of Technology*

\*ALLEN D. BRANDT, S.B., S.M., S.D., Visiting Lecturer on Industrial Hygiene Engineering; *Manager of Industrial Health Engineering, Bethlehem Steel Corporation*

\*LAWRENCE S. COOKE, Visiting Lecturer on Illumination; *District Engineer, General Electric Company*

\*JOHN K. DANE, A.B., LL.B., LL.M., Visiting Lecturer on Workmen's Compensation; *Counsel, Liberty Mutual Insurance Companies.*

\*HORACE W. GERARDE, S.B., S.M., M.D., PH.D., Visiting Lecturer on Industrial Toxicology; *Senior Research Associate, Medical Research Division, Esso Research and Engineering Company*

\*NATHAN VAN HENDRICKS, B.E., CHEM.E., Visiting Lecturer on Industrial Hygiene Engineering; *Assistant Director for Environmental Sciences, Standard Oil Company (New Jersey)*

\* Part-time in the School of Public Health.

† Part-time in the School of Public Health, full-time in Harvard University.



## HARVARD UNIVERSITY

\*JOHN H LUDWIG, S.B., S.M., S.M. IN HYG., S.D. IN HYG., Visiting Lecturer on Community Air Pollution; *Chief, Laboratory of Engineering and Physical Sciences Branch, Division of Air Pollution, Robert A. Taft Sanitary Engineering Center*

R. FRANCES GROMMERS, S.B., M.D., M.P.H., Research Associate in Environmental Health

JAMES R. MAHONEY, S.B., PH.D., Research Associate in Meteorology

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HARRIET L. HARDY, A.B., M.D., *Lecturer on Medicine, Harvard Medical School; Assistant Medical Director in charge of Occupational Medical Service, Massachusetts Institute of Technology*

ALBERT O. SEELER, A.B., M.D., *Lecturer on Medicine, Harvard Medical School; Professor and Medical Director, Massachusetts Institute of Technology*

One of the major objectives of this Department is to provide graduate instruction and research in the prevention and control of occupational diseases. This was the primary objective when the Department was created over forty years ago, and it still is. Other objectives are to provide instruction and research opportunities in the fields of air pollution control and radiological health.

Courses offered by the Department are open to physicians, engineers, and other students with adequate background in physics, chemistry, and biology. The basic course, Industrial Hygiene 3c,d, covers the basic problems of Industrial Hygiene and Industrial Environments. Additional emphasis on Industrial Toxicology and Environmental Physiology is provided by the Department of Physiology. Industrial Hygiene 3c,d is the principal elective course for Master of Public Health candidates. It is also a basic course for students concentrating in the Master of Industrial Health or Master of Science in Hygiene program. The course in Analysis of Air Contaminants is required for the Master of Industrial Health and Master of Science in Hygiene programs, and is available to Master of Public Health candidates.

It is desirable that all students majoring in environmental health have a sound background in chemistry, physics, and mathematics through calculus. Some of the courses in this Department carry "Engineering" numbers and provide course credit through the Division of Engineering and Applied Physics in Cambridge.

### **Industrial Hygiene 3c,d. Basic Problems in Occupational Health and Industrial Environments (Engineering 282)**

Lectures, laboratory demonstrations and field trips. *Two two-hour sessions and one three-hour session each week, third and fourth periods.* Dr. FERRIS, Dr. FIRST and Staff of the Center for Environmental Health.



Credit 6 units.

A course of lectures, demonstrations and inspections showing the relation of working conditions to health with special reference to control of industrial hazards, and of adverse conditions of temperature and humidity, the prevention, diagnosis and treatment of industrial disability and diseases, and workmen's compensation.

#### **Industrial Hygiene 4a,b. Analysis of Air Contaminants (Engineering 281)**

Lectures and laboratory. *Tuesdays, 1:30-3:30; Thursdays, 1:30-4:30, first and second periods.* Mr. VILES and Staff of the Department.

Credit 4 units.

This course deals with methods used in determining gases, vapors, dusts, fumes, and mists in occupational and urban environments. It stresses fundamentals and includes the following topics: the nature of contaminants, threshold limits, sampling principles, and analytical techniques used, such as iodimetry, spectrophotometry, emission spectroscopy, gas chromatography, optical microscopy, and electrometric methods. The use of direct reading field instruments is also described.

This course is intended for public health engineers and physicians enrolled in industrial health programs.

#### **Industrial Hygiene 5a,b. Environmental Control (Engineering 280)**

Lectures and laboratory. *Two one-hour sessions and one three-hour session each week, first and second periods.* Assistant Professor BURGESS and Dr. FIRST.

Credit 4 units.

This course deals with selected topics in environmental control for engineers and physical science majors, including thermal environmental engineering, indices of heat stress, industrial ventilation, hood and duct design, performance of air movers and air cleaning devices, air conditioning, and specially controlled environments such as white rooms, hospital operating rooms, and animal quarters.

#### **Industrial Hygiene 6c,d. Aerosol Technology (Engineering 286)**

Lectures and laboratory. *Two one-hour sessions and one three-hour session each week, third and fourth periods.* Dr. REIST.

Credit 4 units.

This course is a general discussion of aerosol properties and their behavior. It is an advanced course for engineers interested in air pollution evaluation and control.

Prerequisite: Industrial Hygiene 4a,b.

## HARVARD UNIVERSITY

### Industrial Hygiene 7c,d. Radiation Protection Engineering (Engineering 287)

Lectures. *Four one-hour sessions each week, third and fourth periods.*  
Dr. SHAPIRO.

Credit 4 units.

This course gives a presentation of the basic theory and calculations utilized in radiation control and nuclear safety. It is an introduction to reactor physics and deals with the following topics: safeguards for preventing criticality and reactor accidents; radiation shielding; radiation damage; environmental reactor hazard analysis.

Prerequisites: Physics 101, Physics 112b or Environmental Health 4a,b.

### Industrial Hygiene 8c,d. Advanced Air Analysis (Engineering 283)

Lectures and laboratory. *Two one-hour sessions and one three-hour session each week, third and fourth periods.* Mr. VILES and Staff of the Department.

Credit 4 units.

A continuation of Industrial Hygiene 4a,b, Analysis of Air Contaminants, with emphasis on specific methods and applications, including isokinetic sampling, duct and stack analysis, dust identification, air pollution analysis and determination of radioactive, biological and flammable contaminants.

Course 8c,d is intended for air analysts, engineers and properly qualified physicians.

Prerequisite: Industrial Hygiene 4a,b.

### Industrial Hygiene 17a,b,c,d,e.

Tutorial Program (Reading or Research). *Time and credit to be arranged.*

Reading or research assignments for individual tutorial work at a Master's degree level are provided for qualified students in the fields of industrial hygiene, industrial ventilation, aerosol technology, radiological hygiene and air pollution control.

Enrollment is subject to the approval of the Head of the Department.

During 1966-67 a seminar on current problems in health physics and radiation physics will be offered in the third and fourth periods under Industrial Hygiene 17d,e.

### Industrial Hygiene 20. Research

Properly qualified students at the post-master's level or those who have been accepted as doctoral candidates are given an opportunity to pursue independent research work on problems of industrial hygiene, including industrial ventilation, aerosol technology, air pollution control and radiological hygiene.

Enrollment is subject to the approval of the Head of the Department.

## Department of Physiology

JAMES L. WHITTENBERGER, S.B., M.D., A.M., (hon.), James Stevens Simmons  
Professor of Public Health, Professor of Physiology *and* Head of the Department

ROSS A. MCFARLAND, A.B., PH.D., S.D., (hon.), Daniel and Florence Guggenheim  
Professor of Aerospace Health and Safety

JERE MEAD, S.B., M.D., Professor of Physiology

MARY O. AMDUR, S.B., PH.D., Associate Professor of Toxicology

†BENJAMIN G. FERRIS, JR., A.B., M.D., Associate Professor of Environmental  
Health and Safety; *Director of Environmental Health and Safety, University  
Health Services*

HARRY HEIMANN, S.B., M.D., Senior Research Associate in Environmental  
Health *and* Lecturer on Occupational Medicine

\*WILLIAM H. FORBES, A.B., A.M., DR. PHIL., M.D., Lecturer on Physiology

N. ROBERT FRANK, A.B., M.D., Assistant Professor of Physiology

JOHN B. LITTLE, A.B., M.D., Assistant Professor of Radiobiology

SHELDON D. MURPHY, S.B., PH.D., Assistant Professor of Toxicology

JOHN M. PETERS, S.B., M.D., M.P.H., S.D. IN HYG., Assistant Professor of Occupational Medicine

HOWARD W. STOUT, JR., A.B., A.M., PH.D., S.M. IN HYG., Assistant Professor  
of Physical Anthropology

\*HERVEY B. ELKINS, A.B., PH.D., Lecturer on Industrial Toxicology; *Director,  
Massachusetts Division of Occupational Hygiene*

\*DAVID W. FASSETT, A.B., M.D., Visiting Lecturer on Occupational Medicine;  
*Director, Laboratory of Industrial Medicine, Eastman Kodak Company*

†NORMAN H. MACKWORTH, M.B., CH.B., DR. PHIL., Senior Research Associate in  
Physiological Psychology; *Research Fellow in Cognitive Studies*

HARBEN J. BOUTOURLINE-YOUNG, M.B., B.S., D.C.H., M.D., Research Associate in  
Physiology (Absent 1966–67)

ROLAND C. MOORE, A.B., A.M., PH.D., Research Associate in Occupational Safety

JOSEPH D. BRIAN, A.B., S.M., S.M. IN HYG., S.D. IN HYG., Research Associate in  
Physiology

\*DOROTHY B. CHAMBERLIN, S.B., M.D., M.P.H., Research Associate in Physiology

THOMAS J. CROWLEY, S.B., S.M., Research Associate in Environmental Health  
and Safety

† Part-time in the School of Public Health, full-time in Harvard University.

\* Part-time in the School of Public Health.

## HARVARD UNIVERSITY

DAVID E. LEITH, A.B., M.D., Research Associate in Physiology

RONALD M. PICKETT, A.B., A.M., PH.D., Research Associate in Experimental Psychology

LUISA C. STIGOL, M.D., Research Associate in Physiology

\*JOHN M. TYLER, A.B., M.D., Research Associate in Physiology; *Senior Physician and Director of the Pulmonary Laboratory, Lemuel Shattuck Hospital*

ELIHU A. CHANNIN, A.B., M.D., Research Fellow in Physiology

MARGARET HITCHCOCK, B.SC., PH.D., Research Fellow in Physiology

RONALD J. KNUDSON, S.B., M.D., Research Fellow in Physiology

RALPH E. MILLER, JR., A.B., M.D., S.M. IN HYG., Research Fellow in Physiology

GERALD A. RYAN, M.B., B.S. M.D., Research Fellow in Biotechnology

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ROBERT G. MONROE, A.B., M.D., *Associate in Pediatrics at the Children's Hospital*

MARY ELLEN BECK WOHL, M.D., *Instructor in Pediatrics at the Children's Hospital*

The Department of Physiology is a medical science department with interests that extend into several aspects of public health, particularly environmental health. Personnel in the Department include physicians, physiologists, psychologists, physical anthropologists, health and safety specialists, toxicologists, and specialists in radiobiology, occupational medicine and aerospace health and safety. Students and Research Fellows come with similarly varied backgrounds, and the research activities of the Department reflect this broad range of interests.

A fundamental aim of the Department is to provide basic information on the relationship of man to his physical and chemical environment. An introduction to these concepts is presented in the required course Environmental Health 1a,b. These concepts are examined in detail in specialized courses such as Environmental Physiology, Principles of Toxicology, Radiation Biology, and Human Factors in Occupational Performance and Safety. Specific research projects of members of the Department offer the qualified student an opportunity to gain experience in, and to develop a capacity for, critical evaluation of research methods and analysis.

The research programs include topics such as respiratory physiology, effects of ionizing radiation, human factors in transportation safety, effects of environmental chemicals on man and animals, causation of chronic non-specific respiratory disease, exercise and work physiology, and factors involved in fitting the machine and work environment to the capabilities of human performance.



International interests of the Department include a cross-cultural study in Italy and the United States of America that is concerned with environmental factors and their effect on growth and development of school-age children. Another study involves attempts to determine the causation of chronic non-specific respiratory diseases by comparing results obtained by similar methods in various countries.

### **Physiology 3a,b. Human Physiology**

Lectures and demonstrations. *Tuesdays, 10:30-12:30, Tuesdays, 10:30-11:30, first and second periods.* Dr. MEAD, Dr. FRANK and Staff of the Department.

Credit 3 units.

This course is intended for students who lack a background in physiology. The time is divided approximately equally among cellular physiology, organ and organ system physiology, and function of the total organism. The purpose of the laboratory exercises is to give the students some experience with problems of observing living systems.

Prerequisites: College courses in physics, chemistry and mathematics.

### **Physiology 4c. Environmental Physiology**

Lectures and conferences. *One two-hour session each week, third period.* Dr. FORBES and Staff of the Department.

Credit 1 unit.

This course is intended for students specializing in occupational health and takes up in greater detail some of the subjects considered in Environmental Health 1a,b.

The course begins with a discussion of natural and artificial environments. It then takes up human tolerance of high and low temperatures, physical fitness and its measurement, muscular work and the efficiency of various types of muscular work in industry, fatigue, and the effects of age.

Prerequisite: Master of Science in Hygiene candidates who wish to take this course must have had Physiology 3a,b or the equivalent.

### **Physiology 5c,d. Principles of Toxicology**

Lectures and laboratory work. *Two two-hour sessions each week, third period; one one-hour session and one two-hour session each week, fourth period.* Dr. AMDUR and Dr. MURPHY.

Credit 4 units.

A written report is required in this course.

This course presents an introduction to the effects of toxic chemical agents on living organisms with particular reference to experimental techniques of



## HARVARD UNIVERSITY

assessing toxicity. Several classes of toxic agents are studied with respect to mechanisms of action on living tissue, functional changes resulting from exposure, and methods of evaluating the damage produced.

Prerequisite: Physiology 3a,b or equivalent.

### Physiology 6d. Special Topics in Respiratory Physiology

Lectures. *One two-hour session each week, fourth period.* Dr. MEAD and Staff of the Department.

Credit 1 unit.

This course covers special topics in respiratory physiology, according to the interest of the students. It is intended primarily for students in the aviation medicine program. Other students who are specializing in environmental health may enroll with the consent of the Instructor.

### Physiology 7c,d. Radiation Biology

Lectures and laboratory work. *Lectures, two one-hour sessions each week. Laboratory, one three-hour session each week, third and fourth periods.* Dr. LITTLE.

Credit 5 units.

Two additional hours each week of individual laboratory work and written reports are required in this course.

This course deals with the biological effects of ionizing radiation and is divided into two parts, cellular and mammalian radiation biology. Included in the first will be a discussion of elementary target theory, radiation chemistry, effects on macromolecules, cellular and chromosomal effects, and recovery processes. The second part covers the acute and long-term effects of radiation with emphasis on man, as well as a discussion of environmental sources of radiation and the characteristics of internal and external human exposure.

Prerequisites: Environmental Health 4a,b, Physiology 3a,b, or equivalents.

### Physiology 17a,b,c,d,e. Tutorial Program

Time and credit to be arranged.

Opportunities are provided for tutorial work at a master's degree level in the fields of respiratory physiology, toxicology, and occupational medicine.

### Physiology 20. Research

Doctoral candidates and other properly qualified students may undertake laboratory or field research by arrangement with the Head of the Department.

## **Department of Sanitary Engineering**

HAROLD A. THOMAS, JR., S.B., S.M., S.D., Gordon McKay Professor of Civil and Sanitary Engineering

RICHARD L. WOODWARD, B.S.C.E., S.M., PH.D., Senior Research Associate in Sanitary Engineering *and* Lecturer on Environmental Health Sciences and Engineering

JOSEPH J. HARRINGTON, B.C.E., A.M., PH.D., Assistant Professor of Environmental Health Engineering

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The following members of the Division of Engineering and Applied Physics of the Graduate School of Arts and Sciences participate in teaching in the School of Public Health:

J. CARRELL MORRIS, S.B., A.M., PH.D., A.M., (hon), Gordon McKay Professor of Sanitary Chemistry

WERNER STUMM, DR.PHIL., A.M. (hon.), Gordon McKay Professor of Applied Chemistry

MYRON B. FIERING, A.B., S.M., PH.D., Assistant Professor of Engineering and Applied Mathematics

RALPH MITCHELL, B.A., PH.D., Assistant Professor of Applied Biology

EDWARD W. MOORE, A.B., S.M., Lecturer on Sanitary Engineering

ROBERT P. BURDEN, S.B., S.M., S.D., Administrative Associate in the Water Quality Program

The Courses in which members of this Department participate in the School of Public Health are listed under the Environmental Health courses on pages 76-77 and 79-80 (Environmental Health 1a,b and 11c,d).

The following courses of instruction offered in the Division of Engineering and Applied Physics of the Graduate School of Arts and Sciences are open to properly qualified students:

Engineering 250a. Design of Water Resource Systems. Professor THOMAS.

Engineering 250b. Design of Water Resource Systems. Professor THOMAS.

Engineering 253. Advanced Topics in Environmental Engineering. Assistant Professor FIERING.

Engineering 270a Water Supply Engineering. Dr. WOODWARD.

## HARVARD UNIVERSITY

- Engineering 270b. Operations in Water and Waste Treatment. Dr. Woodward.
- Engineering 271a. Water Chemistry. Professor STUMM.
- Engineering 271b. (hf) Processes in Water and Waste Treatment. Professor MORRIS.
- Engineering 272a. Water Quality and Its Control. Professor MORRIS.
- Engineering 272b. Hydrogeochemical Cycles. Professor STUMM.
- Engineering 275. Seminar: Industrial Water and Wastes. Mr. MOORE.
- Engineering 276. Advanced Techniques for Water Analysis. Professor STUMM.
- Engineering 277. Surface Chemistry. Professor MORRIS.
- Engineering 278. Rate Processes. Professor MORRIS.
- Engineering 279a. Introduction to Environmental Biology. Assistant Professor MITCHELL.
- Engineering 289. Applied Electrochemistry. Professor STUMM.

# *Center for the Prevention of Infectious Diseases*

**Thomas H. Weller, A.B., S.M., M.D., LL.D., Director**

The Center for the Prevention of Infectious Diseases is comprised of the Departments of Microbiology and of Tropical Public Health. Working in close collaboration, the staffs of the two Departments are concerned with the broad spectrum of agents, i.e., viral, rickettsial, bacterial, mycotic, protozoal, and helminthic entities, that parasitize man, and with their relevant arthropod and molluscan vectors.

On a global basis the infectious diseases remain a primary cause of mortality. In the developed areas of the world, morbidity attributable to infectious diseases persists as a major impediment to the enjoyment of complete health. An increasing number of chronic degenerative diseases are recognized as stemming from the insults of prior infectious processes. In many societies, acceptance of the concept of population control awaits containment of undue mortality induced by the infectious diseases, and the consequent assurance that children who are born will have a reasonable prospect of achieving maturity. Considerations such as the foregoing emphasize the continuing need for the public health expert to possess knowledge of the rapidly changing technology of the control of infectious diseases, as well as a basic knowledge concerning the attributes and epidemiologic characteristics of the responsible agents.

The Faculty of the Center for the Prevention of Infectious Diseases operate in close collaboration to discharge a common responsibility for multidisciplinary instruction in the various facets of diseases of infectious etiology. The formal course offerings of the two Departments are designed and scheduled to permit the acquisition of a broad basic knowledge of infectious diseases as well as an introduction to specialized subject areas. For advanced qualified students, concentration in specific areas with participation in collaborative or individual research is encouraged both at the pre-doctoral and the post-doctoral levels. The wide variety of current research projects in the Center permits acquisition of experience both at home and abroad in the laboratory or in the field. Training grant funds are available for the support of qualified individuals specifically interested in public health bacteriology, rickettsiology, virology, mycology, parasitology, and tropical medicine.



## Department of Microbiology

JOHN C. SNYDER, A.B., M.D., LL.D., Henry Pickering Walcott Professor of Public Health and Head of the Department

\*GEOFFREY EDSALL, M.D., Professor of Applied Microbiology; *Superintendent, Institute of Laboratories, Massachusetts Department of Public Health*

SAMUEL D. BELL, JR., A.B., M.D., M.P.H., Associate Professor of Microbiology

CHARLOTTE C. CAMPBELL, S.B., Associate Professor of Medical Mycology

ROBERT S. CHANG, B.SC., M.D., S.D. IN HYG., Associate Professor of Microbiology

HERBERT L. LEY, JR., M.D., M.P.H., Associate Professor of Epidemiology and Microbiology

EDWARD S. MURRAY, A.B., M.D., M.P.H., Associate Professor of Microbiology

\*ROBERT A. MACCREADY, S.B., M.D., Lecturer on Applied Microbiology; *Director, Division of Diagnostic Laboratories, Massachusetts Department of Public Health*

\*ROGER L. NICHOLS, A.B., M.D., Assistant Professor of Applied Microbiology; *Associate Director, Aramco Trachoma Program for Saudi Arabia, and Chief of Medical Research, Medical Department, Arabian American Oil Company* (Absent 1966-67)

\*HERALD R. COX, A.B., S.D., S.D. (hon.), Visiting Lecturer on Microbiology; *Director of Virus Research, Lederle Laboratories Division, American Cyanamid Company*

\*ROBERT B. PENNELL, S.B., S.M., PH.D., Lecturer on Immunology; *Director of Laboratories, The Protein Foundation, Inc.*

\*CHARLES H. RAMMELKAMP, A.B., M.D., S.D. (hon.), Visiting Lecturer on Microbiology; *Professor of Medicine, Western Reserve University School of Medicine*

MANUEL ROCA-GARCIA, M.D., M.P.H., Research Associate in Microbiology

J. WILLIAM VINSON, S.B., S.D. IN HYG., Research Associate and Lecturer on Microbiology

\*MARTHA D. BERLINER, A.B., S.M., PH.D., Research Associate in Microbiology; *Instructor in Biology, Simmons College*

\*CHARLES E. O. FRASER, B.V.SC., M.R.C.V.C., D.T.V.M., S.M., Research Associate in Microbiology; *Microbiologist, New England Regional Primate Research Center*

\* Part-time in the School of Public Health.

\*KENNETH F. GIRARD, S.B., M.SC., PH.D., Research Associate in Microbiology; *Assistant Director, Division of Diagnostic Laboratories, Massachusetts Department of Public Health*

\*VICTOR LORIAN, M.D., Research Associate in Microbiology; *Director, Clinical and Research Laboratories, Sanatorium Division, Boston City Hospital and Assistant Clinical Professor, Boston University School of Medicine*

JOHN H. PETERS, S.B., M.D., Research Associate and Lecturer on Microbiology

MARIE EBE RECA, DR.CHEM., Research Associate in Medical Mycology

\*GRACE C. YUAN, B.SC., M.D., Research Associate in Microbiology

ARTUR M. GALAZKA, M.D., Research Fellow in Microbiology

\*LEO LEVINE, S.B., Assistant in Microbiology; *Chief of Laboratory, Biologic Laboratories, Massachusetts Department of Public Health*

DOROTHY E. McCOMB, S.B., Assistant in Microbiology

JANE D. O'CONNOR, S.B., Assistant in Microbiology

\*JUDITH M. SPIELMAN, S.B., S.M. IN HYG., Assistant in Microbiology

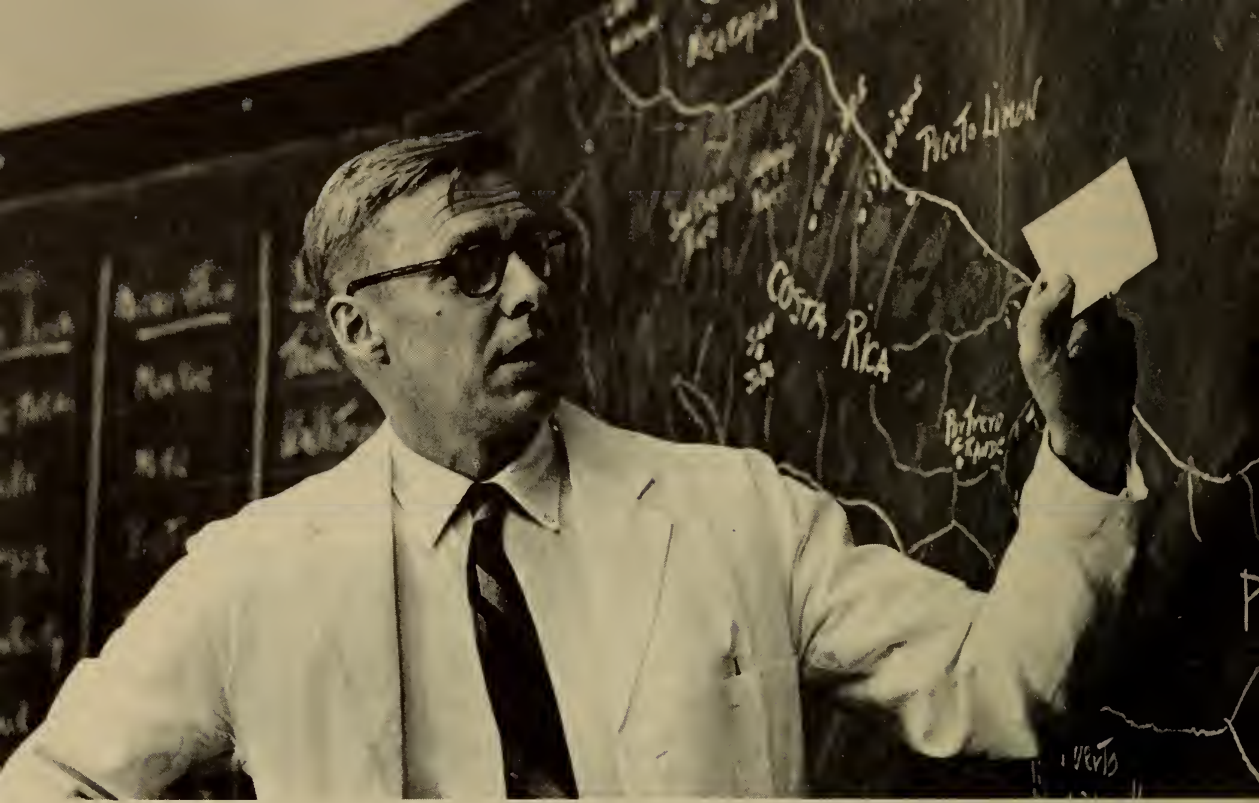
LOUIS WEINSTEIN, S.B., S.M., PH.D., M.D., *Lecturer on Infectious Diseases, Harvard Medical School; Professor of Medicine, Tufts University School of Medicine*

The Department of Microbiology is concerned with infectious diseases caused by bacteria, fungi, viruses, rickettsiae, and bedsoniae. In addition to prevention and control of such infections, the interests of the Department include the general ecology of the causative microorganisms, the natural history of the diseases in question, and their mechanisms of transmission.

The Department shares the responsibility for teaching and research on infectious diseases with the Department of Tropical Public Health. A major objective of both Departments is to interrelate the laboratory with epidemiologic and ecologic aspects of the principal infectious disease problems in both the advanced and the developing regions of the world. In general, the courses of instruction presented by the Department require a background in the medical and/or biological sciences.

The basic course, Microbiology-Tropical Public Health 1a,b, is designed to provide students in the Master of Public Health program with the principles of microbiology and parasitology, as well as the most recent advances in factual information essential to a general understanding and comprehensive approach to resolving infectious disease problems in the field of public health.

The advanced courses of the Department are offered for students who wish to acquire a better understanding of the broad range of problems in infectious diseases of public health importance. The advanced courses also serve as an introduction for the individual who proposes to specialize in



microbiology and to undertake original investigation in this field of knowledge. In this context, students may register for Microbiology 17 or 20 after they have acquired or have demonstrated technical skill essential for safety in dealing with highly infectious microorganisms. These two courses provide the opportunity for working in close association with a member of the Staff. The choice of problems for individual work is illustrated under Microbiology 17 and 20. As noted therein, the present Departmental research activities encompass a wide range of interests, including not only basic studies on viral, rickettsial, bacterial and mycotic agents, per se, but also biological aspects of host-parasite relationships, ecologic and environmental factors, properties of human cells in tissue culture, immunologic problems and statistical and field assay techniques.

The Institute of Laboratories of the Massachusetts Department of Public Health has a close affiliation with the School of Public Health. The senior staff members of the Institute hold appointments in the Department. The changing responsibilities, problems and developments of the present-day public health laboratory are thus brought actively into the teaching program of the Department.

Training programs supported by the National Institutes of Health are available to assist qualified applicants who desire training in infectious diseases.

In addition to satisfying the general requirements of the School, candidates for the Master of Public Health degree who elect to concentrate in



Microbiology are expected to complete Microbiology 2b, and 4c, and at least three of the following Microbiology 11d, 12c,d, 13d and 15d.

### **Microbiology and Tropical Public Health 1a,b. Ecology and Epidemiology of Infectious Diseases**

Lectures, seminars, and laboratory exercises. *Mondays, Wednesdays, Fridays, 9:30–10:30, first and second periods; Fridays, 1:30–4:30, first period and 1:30–3:30, second period.* Dr. WELLER, Associate Professor CAMPBELL, and Staff of the two Departments.

Credit 4 units.

Required of all candidates for the degree of Master of Public Health.

This course is designed to provide an integrated presentation of information on communicable diseases of major public health importance. The exercises include discussions of the present status of infectious diseases in temperate and tropical climates, of procedures for their control at the community level, and of techniques available for study of microorganisms and parasites with special reference to recently developed methods which have opened a new era in microbiology. Coverage of etiologic agents includes the protozoa, helminths, viruses, rickettsiae, spirochetes, fungi, and bacteria. To achieve a comprehensive approach, subjects of public health importance and of diverse etiologies, such as the acute respiratory diseases, are considered in an integrated manner. Other important entities, such as malaria and schistosomiasis, are selected for emphasis as case examples to illustrate epidemiological concepts and the elements of control.

The course assumes a medical school background and an understanding of the pathogenesis of disease produced by infectious agents in the affected individual. It is concerned primarily with the ecologic factors affecting transmission of infectious agents in the human community, with assessment of public health significance of representative infectious diseases, and with approaches to their prevention and control. In the laboratory, the student is not expected to acquire technological skills, but rather an understanding of the potentialities as well as of the limitations of pertinent public health laboratory procedures.

### **Microbiology 2b. Current Research in Microbiology**

*Mondays, 1:30–3:30, second period.* Dr. SNYDER and Staff of the Department.

Credit 1 unit.

This course is arranged for the students who are concentrating in microbiology, epidemiology or tropical public health. Important papers from current periodicals on topics of general interest are assigned to the students for presentation. These papers are reviewed critically in respect to evaluation of the



## HARVARD UNIVERSITY

experimental work, analysis of the results, organization of the manuscripts, and clarity of presentation.

The purpose of the course is to develop the ability of the students to read the literature analytically and to plan their own work and manuscripts effectively.

### Microbiology 3c. Clinical Problems in Infectious Diseases

Lectures and clinics. Given at the New England Center Hospital. *Wednesdays, 4-6, third period.* Dr. WEINSTEIN.

Credit 1 unit.

Problems of diagnosis, treatment and control of the common acute communicable diseases of temperate climates, as well as discussions of infectious diseases that are usually not considered communicable.

### Microbiology 4c. Public Health and Laboratory Aspects of Infectious Diseases of Microbial Origin

Seminars and laboratory exercises. *Two three-hour sessions and one one-hour session each week, third period.* Dr. MURRAY, Dr. BELL, Dr. CHANG, Dr. LEY, Dr. MACCREADY, Dr. GIRARD, Dr. PETERS, Dr. VINSON and Associate Professor CAMPBELL.

Credit 2.5 units.

This course is an amplification of Microbiology—Tropical Public Health 1a,b. The exercises are directed to the further study of infectious diseases of bacterial, rickettsial, viral and mycotic origin and to the laboratory procedures by which infections and disease, caused by these agents, are identified, prevented and/or controlled.

Seminars are oriented to the epidemiologist, as well as to the microbiologist. The comprehensive approach is emphasized in resolving outbreaks of infectious diseases. The discussions stress the potentialities and limitations of the various laboratory techniques employed in the conduct of representative types of field investigations.

Laboratory exercises carried out by the students include the conventional procedures used in the isolation and identification of bacteria, spirochetes and fungi of greatest importance in public health; tissue culture and egg inoculation techniques for isolation and characterization of viruses and rickettsiae; and miscellaneous methods, such as animal inoculation and serologic techniques, as they are variously employed in each of these specialized areas of microbiology.

Limited to fourteen students who are enrolled in Microbiology-Tropical Public Health 1a,b,c.

**Epidemiology and Microbiology 5c. Epidemiologic Problems in Infectious Diseases**

Conferences, seminars, laboratory exercises. *Two two-hour sessions each week, third period.* Dr. LEY and Staffs of the Departments.

Credit 2 units.

A course given by the Staffs of the Departments of Microbiology, Epidemiology and Tropical Public Health providing experience in solving epidemiologic problems in communicable diseases.

**Microbiology and Tropical Public Health 6c. Tuberculosis**

Conferences, seminars and demonstrations. *Two one-hour sessions each week, third period.* Dr. KOCH-WESER and Associate Professor CAMPBELL.

Credit 1 unit.

The purpose of this course is to provide an understanding of the ecology and the public health significance of tuberculosis which continues to be a worldwide problem of major importance. Various features of tuberculosis are presented, particularly the microbiologic, medical, social, and economic aspects.

Demonstrations of pertinent material are given by the instructors, and previously assigned literature is discussed. The course also considers the significance of diseases often confused with tuberculosis, especially the mycoses.

**Microbiology 7a,b. Immunologic Aspects of Microbiology**

Lectures, conferences and laboratory sessions. *Two one-hour sessions and one two-hour session each week, first and second periods.* Dr. PETERS.

Credit 3 units.

The purpose of this course is to explore the fundamental principles and techniques of immunology through lectures, conferences, appropriate demonstrations and active laboratory participation. The major areas to be covered are: the nature of immunoglobulins, complex nature of cellular and microbial antigens, mechanisms of antibody formation and antibody-antigen interactions, chemical basis of immunological specificity, immunologic tolerance and the host-parasite relationship, hypersensitivity and immunologic mechanisms of tissue damage, genetic aspects of the immune response and the role of immunologic mechanisms in innate immunity and resistance to infection.

Although understanding of basic principles is to be emphasized, special attention is also given to the application and usefulness of immunochemical methods in the study of various microbiological problems.

The course is intended primarily for students in the Master of Science in Hygiene, and Doctor of Science in Hygiene programs and for postdoctoral trainees interested in learning immunologic methods of relevance to their

## HARVARD UNIVERSITY

investigations. Other interested students may take the course with the approval of the Instructor. In selected cases, the lecture series may be taken without the laboratory.

This course will not be given for less than five students.

### **Microbiology and Tropical Public Health 11d. Medical Mycology**

Laboratory, conferences and field exercises. *One three-hour session and three hours of individual laboratory work each week, fourth period.* Associate Professor CAMPBELL and Staff of the Departments.

Credit 2 units.

This course is designed to provide the student with the principles and techniques essential to the study of pathogenic fungi of medical and public health importance. The course consists of conferences, lectures and laboratory, and field work under tutorial supervision. Emphasis is placed on the isolation of mycotic agents from cases in humans and sources in nature by *in vitro* and *in vivo* cultivation, and on identification by morphologic, biochemical and histologic characteristics. Procedures for soil baiting, soil sampling, skin and serologic tests, as adjuncts in establishing indirect or presumptive diagnosis and in defining geographic distribution and areas of high endemicity, are integral aspects of the course.

The course is designed to prepare graduates for laboratory research or field studies in the area of medical mycology.

Enrollment is subject to the approval of the Instructor.

### **Microbiology 12c,d. Applied Immunology and Public Health Laboratory Practice**

Seminars. *One two-hour session each week, third and fourth periods.* Dr. EDSALL and Associates at the Massachusetts Institute of Laboratories.

Credit 2 units.

The first part of this course deals with the principles and problems associated with the preparation and testing of immunizing agents and other biologic products currently being used in public health practice.

The second part of the course considers the fact-finding and policy-guiding responsibilities of the public health laboratory as evidenced by problems in bacteriology, immunology, metabolic disorders, or ecology of infectious diseases. Some of the exercises are conducted at the Massachusetts Institute of Laboratories.

### **Microbiology 13d. Intracellular Microorganisms Pathogenic for Man**

Laboratory exercises and seminars. *One three-hour session each week, and three hours of individual laboratory work each week, fourth period.* Dr. MURRAY, Dr. BELL, Dr. CHANG and Staff of the Department.

Credit 2 units.

This course consists of laboratory exercises and seminars which provide an understanding of the techniques available for study of the growth and the characteristics of representative strains of rickettsiae, bedsoniae, or viruses which are important human pathogens. Each student performs the procedures for identification of an unknown pathogen under supervision of the Staff. Seminars emphasize the public health implications of the diseases being studied in the laboratory exercises.

Enrollment is limited to ten students who have completed Microbiology 4c or who have had equivalent preparation previously.

### **Microbiology 15d. Problems in Medical Bacteriology**

Seminars and laboratory exercises. *One three-hour session each week, fourth period.* Associate Professor CAMPBELL and Staff of the Department.

Credit 1 unit.

This course offers the medically trained student an opportunity to acquire additional experience with the laboratory procedures currently in use for work on bacteria of primary concern to public health. The exercises consist of laboratory demonstrations and procedures, seminar discussions, and review of recent publications. Various problems are considered such as the laboratory diagnosis of epidemics caused by salmonella, shigella, staphylococci, streptococci and other bacterial pathogens.

### **Microbiology 17a,b,c,d. Introduction to Research in Microbiology**

*Time and credit to be arranged.* Staff of the Department.

*Students who wish to learn the basic principles and techniques essential to microbiologic research may register for laboratory work to be conducted under the direct supervision of a member of the Departmental Staff.*

Course 17 may be elected by candidates for the Master of Public Health or the Master of Science in Hygiene degrees, and may be taken concurrently with the regularly scheduled courses of the Department. Enrollment requires the consent of the staff member who is to be responsible for supervision of the student's work. The various subject areas are listed below by category.

#### **17.1 Pathogenic Fungi, Associate Professor CAMPBELL.**

Nutritional requirements; classification on the basis of immunologic properties; serologic procedures for diagnosis of acute respiratory mycoses.

Microorganisms available for study: fungi causing histoplasmosis, coccidioidomycosis, etc.

#### **17.2 Rickettsiae, Dr. MURRAY, Dr. LEY and Dr. VINSON.**

Techniques for propagation of pathogenic rickettsiae; the study of antigenic components; serologic reactions; potency of vaccines.



## HARVARD UNIVERSITY

Microorganisms available are: rickettsiae causing epidemic typhus fever; Brill-Zinsser disease; scrub typhus, Rocky Mountain spotted fever; trench fever.

### 17.3 *Bedsoniae*, Dr. BELL, Dr. MURRAY, Dr. NICHOLS and Dr. PETERS.

Trachoma; inclusion conjunctivitis of man; psittacosis; lymphogranuloma venereum; inclusion conjunctivitis of guinea pigs. Laboratory research includes techniques for propagation of bedsoniae; diagnostic procedures including immunofluorescence; antigenic patterns; serologic reactions; and vaccine assays.

### 17.4 *Viruses*, Dr. CHANG and Dr. BELL.

Isolation and identification of representative viruses by use of tissue cultures, animal inoculation, serologic techniques.

Viruses used in instruction in research methodology; vaccinia, influenza, adenoviruses, lipovirus.

### 17.5 *Human Cell Culture*, Dr. CHANG.

Cultivation of human cells in the laboratory and observation of effects of various external agents on different cell lines.

### 17.6 *Immunochemical Methods*, Dr. PETERS.

Experiments with immunofluorescence, immunoelectrophoresis, and other techniques as applied to research on microorganisms and mechanisms of tissue damage.

### 17.7 *Problems in Public Health Laboratory Practice*, Dr. EDSALL and Associates at the Massachusetts Institute of Laboratories.

Participation in the research of the Institute of Laboratories, including development and evaluation of knowledge relating to one of the functions of the Institute.

## Microbiology 20a,b,c,d. Research in Microbiology

Doctoral candidates, research fellows, or full-time special students who have experience equivalent to that provided by the laboratory courses offered by the Department may register for Microbiology 20 in order to undertake original research in virology, rickettsiology, mycology, bacteriology or immunology. Enrollment requires the concurrence of the Director of the Center for the Prevention of Infectious Diseases, the Head of the Department, and the staff member in charge of the particular area of research elected by the student. Several of the current research activities of the Department of Microbiology are indicated under Course 17 (p. 99). Inquiries as to specific research opportunities should be addressed to the Head of the Department.

## Department of Tropical Public Health

THOMAS H. WELLER, A.B., S.M., M.D., LL.D., Richard Pearson Strong Professor of Tropical Public Health, Director of the Center for the Prevention of Infectious Diseases, *and* Head of the Department

FRANKLIN A. NEVA, S.B., M.D., A.M. (hon.), John LaPorte Given Professor of Tropical Public Health

\*ROBERT B. WATSON, S.B., M.D., M.P.H., Visiting Professor of Tropical Health; *Associate Director, Medical and Natural Sciences, The Rockefeller Foundation and Lecturer in International Health, University of North Carolina School of Public Health*

CHARLOTTE C. CAMPBELL, S.B., Associate Professor of Medical Mycology

ELI CHERNIN, S.B., A.M., S.D., Associate Professor of Tropical Public Health

THOMAS E. FROTHINGHAM, M.D., Associate Professor of Tropical Public Health

DIETER KOCH-WESER, M.D., S.M., PH.D., Associate Professor of Tropical Health and Human Ecology *and* Assistant to the Dean for Latin American Programs

RICHARD H. DAGGY, S.B., S.M., PH.D., M.P.H., DR.P.H., Lecturer on Tropical Public Health *and* Associate Dean for International Programs

EDWARD H. MICHELSON, S.B., S.M., PH.D., Assistant Professor of Tropical Public Health

STEVE C. PAN, B.S.C., M.D., M.P.H., Assistant Professor of Tropical Public Health

ANDREW SPIELMAN, S.B., S.D., Assistant Professor of Tropical Public Health

\*G. ROBERT COATNEY, A.B., A.M., PH.D., S.D. (hon.), Visiting Lecturer on Tropical Public Health; *Professor of Pharmacology, Louisiana State University School of Medicine*

\*NEVILLE R. E. FENDALL, B.S.C., M.R.C.S., L.R.C.P., M.B.,B.S., M.D., D.P.H., Visiting Lecturer on Tropical Public Health; *Staff Member, The Population Council, Inc.*

\*SAMUEL B. KIRKWOOD, A.B., M.D., Visiting Lecturer on International Health; *President, The American University of Beirut*

\*HARRY MOST, S.B., M.D., D.T.M. & H., D.M.S., Visiting Lecturer on Tropical Public Health; *Herman N. Biggs Professor and Chairman, Department of Preventive Medicine, New York University School of Medicine*

\* Part-time in the School of Public Health.

## HARVARD UNIVERSITY

\*PAUL F. RUSSELL, A.B., M.D., M.P.H., S.D. (hon.), Visiting Lecturer on Tropical Public Health; *Staff Member, Emeritus, The Rockefeller Foundation*

\*SAMUEL W. SIMMONS, S.B., A.M., PH.D., Visiting Lecturer on Tropical Public Health; *Scientist Director and Chief, Technology Branch, Communicable Disease Center*

\*JOHN M. WEIR, S.B., M.D., PH.D., M.P.H., Visiting Lecturer on Tropical Public Health; *Director, Medical and Natural Sciences, The Rockefeller Foundation*

\*CATHERINE C. SEARS, A.B., M.D., M.P.H., Instructor in Tropical Health

EMILE S. DEMIAN, B.SC., M.SC., PH.D., Research Fellow in Tropical Public Health

DONALD E. GILBERTSON, S.B., S.M., PH.D., Research Fellow in Tropical Public Health

ROBERT J. M. WILSON, B.SC., PH.D., Research Fellow in Tropical Public Health

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GUSTAVE J. DAMMIN, A.B., M.D., A.M. (hon.), *Elsie T. Friedman Professor of Pathology, Harvard Medical School*

FRANZ C. VON LICHTENBERG, M.D., DR. (hon.), *Assistant Professor of Pathology at the Peter Bent Brigham Hospital*

The health problems of the tropical regions, as in poorly sanitized areas of the world elsewhere, are predominantly of an infectious and nutritional nature. The infectious diseases are the primary concern of the Department of Tropical Public Health, with particular emphasis given to protozoal, helminthic, and viral entities and to relevant arthropod and molluscan intermediate hosts. Within the framework of the Center for Prevention of Infectious Diseases, the Department of Tropical Public Health shares with the Department of Microbiology the responsibility for an integrated presentation of information on important infectious agents that produce disease in man. Emphasis is given to the ecology and epidemiology of the major infectious diseases and to their prevention and control.

The resolution of the health problems of tropical areas, as elsewhere, requires not only a specific knowledge of diseases but a multidisciplinary approach involving a considered appraisal of human resources as well as of relevant social, economic, and political factors. This elemental concept underlies the teaching program of the Department of Tropical Public Health, and is exemplified in the course Tropical Public Health 3d, Problems in Tropical Health, open to all students. However, the student concentrating in the Department in preparation for a career in the field of international health should, in addition to Departmental courses, acquire a broadened experience by elective work in other areas under the aegis of the Division of International Health.

The basic course, Microbiology and Tropical Public Health 1a,b, is designed to provide students in the Master of Public Health program with newly-elaborated knowledge regarding major infectious diseases, and with the factual information concerning the epidemiology and control of selected entities of public health importance. Students concentrating in the Department are expected to elect Tropical Public Health 2b, Tropical Public Health 3d, and Tropical Public Health 4c. Other advanced courses in Tropical Public Health are considered electives, to be selected on the basis of individual student interest and need.

The investigative program in the Department is broad and currently deals with pathogens ranging from viruses to helminths. Thus, studies on the *in vitro* cultivation and the physiology and immunology of a wide variety of agents are in progress. Biological investigations on the molluscan vectors of the schistosomes comprise another area of major interest. Facilities are available for the training of a limited number of students at the Doctor of Public Health or Doctor of Science in Hygiene level, who may wish to spend a minimum of two years with emphasis on a program of original research. Due to time limitations, the Doctor of Science in Hygiene applicant should, in so far as possible, obtain the necessary medical science background prior to enrollment.

A program supported by the National Institutes of Health is available to assist qualified applicants who desire training in medical parasitology (see page 165) and a similar program is available to provide training in tropical medicine. Collaborative arrangements established with institutions in the tropics provide diversified opportunities for study and research overseas.

### **Microbiology and Tropical Public Health 1a,b. Ecology and Epidemiology of Infectious Diseases**

Lectures, seminars, and laboratory exercises. *Mondays, Wednesdays, Fridays, 9:30–10:30, first and second periods; Fridays, 1:30–4:30, first period and 1:30–3:30, second period.* Dr. WELLER, Associate Professor CAMPBELL and Staff of the two Departments.

Credit 4 units.

Required of all candidates for the degree of Master of Public Health, this course is designed to provide an integrated presentation of information on communicable diseases of major public health importance. The exercises include discussions of the present status of infectious diseases in temperate and tropical climates, of procedures for their control at the community level, and of techniques available for study of microorganisms and parasites with special reference to recently developed methods which have opened a new era in microbiology. Coverage of etiologic agents includes the protozoa, helminths, viruses, rickettsiae, spirochetes, fungi, and bacteria. To achieve a comprehensive approach, subjects of public health importance and



## HARVARD UNIVERSITY

of diverse etiologies, such as the acute respiratory diseases, are considered in an integrated manner. Other important entities, such as malaria and schistosomiasis, are selected for emphasis as case examples to illustrate epidemiological concepts and the elements of control.

The course assumes a medical school background and an understanding of the pathogenesis of disease produced by infectious agents in the affected individual. It is concerned primarily with the ecologic factors affecting transmission of infectious agents in the human community, with assessment of public health significance of representative infectious diseases, and with approaches to their prevention and control. In the laboratory, the student is not expected to acquire technological skills, but rather an understanding of the potentialities as well as of the limitations of pertinent public health laboratory procedures.

### **Tropical Public Health 2b. Evaluation of Current Research**

Seminars and discussions. *Mondays, 1:30-3:30, second period.* Staff of the Department.

Credit 1 unit.

Students particularly interested in tropical health meet with the Staff of the Department for the presentation and critical analysis of papers selected from the current literature or for discussion of current research.

Required of students concentrating in the Department; open to others with the approval of the Head of the Department.

### **Tropical Public Health 3d. Problems in Tropical Health**

Lectures and conferences. *One two-hour session each week, fourth period.* Dr. WELLER and Guest Lecturers.

Credit 1 unit.

This course is designed to provide general background information on environmental, social, economic, and political factors influencing the development of health programs in the tropics. At each session a distinguished guest lecturer covers an assigned topic; the subject material includes such diversified topics as the development of professional education in tropical areas, the important problems of agriculture, nutrition, and water supply, and the administrative and political backgrounds in the field of international technical cooperation. Each formal presentation is followed by a period devoted to informal student discussion. Enrollment is open to all students.

### **Tropical Public Health 4c. Public Health Aspects of Parasitic Diseases**

Lectures, seminars, and laboratory exercises. *Two three-hour sessions each week, third period.* Dr. PAN, Dr. NEVA, Dr. FROTHINGHAM and Staff of the Department.

Credit 2.5 units.

This course amplifies material presented in the basic course, and additionally provides coverage of significant parasitic entities not dealt with in Microbiology-Tropical Public Health 1a,b. Concepts relevant to the investigation and control of parasitic diseases, such as quantitation of infection, are stressed. Selected examples of control programs will be examined. In the laboratory, the student will become familiar with techniques essential for the epidemiologic investigation of the important parasitic diseases of man.

Enrollment is limited and is subject to the approval of the Instructor.

### **Tropical Public Health 5c. Clinical and Pathologic Features of Tropical Diseases**

Case presentations, clinico-pathologic conferences, and demonstrations. *One two-hour session each week, third period.* Dr. NEVA, Dr. VON LICHTENBERG and Staff of the Department.

Credit 1 unit.

This course, designed for students particularly interested in tropical medicine, supplements material presented in Microbiology-Tropical Public Health 1a,b. The emphasis is on the clinico-pathologic aspects of tropical diseases. At each session one or more disease entities are introduced by presentation of a clinical case and pertinent clinical and pathological features of the disease are then reviewed.

Enrollment is subject to the approval of the Instructor.

### **Microbiology and Tropical Public Health 6c. Tuberculosis**

Conferences, seminars and demonstrations. *Two one-hour sessions each week, third period.* Dr. KOCH-WESER and Associate Professor CAMPBELL.

Credit 1 unit.

The purpose of this course is to provide an understanding of the ecology and the public health significance of tuberculosis which continues to be a worldwide problem of major importance. Various features of tuberculosis are presented, particularly the microbiologic, medical, social, and economic aspects.

Demonstrations of pertinent material are given by the instructors, and previously assigned literature is discussed. The course also considers the significance of diseases often confused with tuberculosis, especially the mycoses.

### **Tropical Public Health 7d. Introduction to Molluscs of Public Health Importance**

Conferences, laboratory and field exercises. *One three-hour session each week, fourth period.* Dr. MICHELSON.

Credit 1 unit.

To be given in 1966-67; alternates yearly with Tropical Public Health 8d.

## HARVARD UNIVERSITY

This is an introductory course designed to acquaint the student with the molluscs which may act either as active or passive agents for the dispersal of pathogens, toxins, or parasites which cause disease in man. Special emphasis is given to snails which serve as intermediate hosts of mammalian schistosomes. Students are offered the opportunity to study field and laboratory techniques necessary for an understanding of the taxonomy, morphology, cultivation, ecology and control of these medically important molluscs.

Enrollment is subject to the approval of the Instructor.

### **Tropical Public Health 8d. Epidemiology and Control of Schistosomiasis**

Seminars and laboratory exercises. *One three-hour session each week, fourth period.* Dr. MICHELSON, Dr. CHERNIN, Dr. PAN, Dr. WELLER.

Credit 1 unit.

To be given in 1967-68; alternates yearly with Tropical Public Health 7d.

The problems posed by schistosomiasis as an expanding health hazard are presented in a series of seminars and laboratory exercises. Emphasis is given to the biology of snail vectors, to problems of assessment of significance of the disease, and to the potentials of various approaches to control. Opportunity to become familiar with appropriate techniques is afforded in the laboratory.

Enrollment is subject to the approval of the Instructor.

### **Tropical Public Health 9d. Introduction to Medical Entomology**

Conferences, laboratory, and field exercises. *One three-hour session each week, fourth period.* Dr. SPIELMAN.

Credit 1 unit.

To be given in 1967-68; alternates yearly with Tropical Public Health 10d.

This course deals with the insects, ticks, and mites of public health importance. The manner in which arthropods transmit disease and the principles of vector control are discussed from ecological, physiological and genetic points of view. Each conference presents an aspect of arthropod biology as it pertains to public health. Laboratory colonies of various vector species are maintained by the students to provide the basic material for study of life cycles and for arthropod identification. Laboratory and field exercises demonstrate entomological techniques currently employed by epidemiologists.

Enrollment is subject to the approval of the Instructor.

### **Tropical Public Health 10d. Current Problems in Malariology**

Seminars and laboratory exercises. *One three-hour session each week, fourth period.* Dr. CHERNIN, Dr. SPIELMAN, Dr. WELLER, and Staff of the Department.



Credit 1 unit.

To be given in 1966-67; alternates yearly with Tropical Public Health 9d.

This course supplements the subject material on malaria offered in Microbiology-Tropical Public Health 1 a, b and Tropical Public Health 4c. Particular attention is given to problems now encountered in eradication and control programs. In the laboratory, experience is provided with procedures essential to the epidemiologic investigation of malaria.

Enrollment is subject to the approval of the Instructor.





## HARVARD UNIVERSITY

### Microbiology and Tropical Public Health 11d. Medical Mycology

Laboratory, conferences and field exercises. *One three-hour session and three hours of individual laboratory work each week, fourth period.* Associate Professor CAMPBELL and Staffs of the Departments.

Credit 2 units.

This course is designed to provide the student with the principles and techniques essential to the study of pathogenic fungi of medical and public health importance. The course consists of conferences, lectures and laboratory and field work under tutorial supervision. Emphasis is placed on the isolation of mycotic agents from cases in humans and sources in nature by *in vitro* and *in vivo* cultivation, and on identification by morphologic, biochemical and histologic characteristics. Procedures for soil baiting, soil sampling, skin and serologic tests, as adjuncts in establishing indirect or presumptive diagnosis and in defining geographic distribution and areas of high endemicity, are integral aspects of the course.

The course is designed to prepare graduates for laboratory research or field studies in the area of medical mycology.

Enrollment is subject to the approval of the Instructor.

### Tropical Public Health 12b,c. Parasitic Infections of Man

Lectures, laboratory exercises and demonstrations. *Twelve afternoons, Mondays, Wednesdays, and Fridays, 2-5, January and February.* Dr. WELLER, Dr. NEVA, Dr. CHERNIN, Dr. FROTHINGHAM, Dr. MICHELSON, Dr. PAN and Staff of the Department.

Credit 2 units.

This course is designed primarily for students in the School of Medicine. It is open, however, to a limited number of students registered in the School of Public Health. The important helminth and protozoan parasites of man are considered with reference to their geographic distribution, identification, mode of transmission, pathogenesis, immune reactions, and methods for prevention and control. Clinical aspects and chemotherapy of parasitic diseases are discussed. Emphasis is given to methods of laboratory diagnosis. Arthropods of parasitologic importance are briefly surveyed.

### Tropical Public Health 17a,b,c,d,e. Introduction to Laboratory Research

Laboratory exercises. Time and credit to be arranged.

Individual work for candidates at the Master's degree level may be carried out under supervision of a member of the Department. A variety of parasites of medical importance are maintained and are available for studies on metabolism, host-parasite relationships, and chemotherapy. Arrangements are subject to the approval of the Instructor.

**Tropical Public Health 20. Research**

Doctoral candidates or qualified full-time special students may undertake original investigations in the laboratory or in the field by arrangement with the Head of the Department.

Members of the Department are currently engaged in the following areas of research:

- (1) Tissue culture and immunological techniques as applied to problems in medical virology (Dr. Weller, Dr. Neva, and Dr. Frothingham).
- (2) Cultivation *in vitro* of parasitic helminths, protozoa, and other invertebrates of medical importance (Dr. Weller, Dr. Neva, Dr. Chernin, Dr. Frothingham, and Dr. Pan).
- (3) Biology, host-parasite relationships, and control of molluscan vectors of schistosomiasis and of other parasitic infections (Dr. Chernin, Dr. Michelson, and Dr. Pan).
- (4) Population genetics, nutrition, and reproduction of medically important arthropods (Dr. Spielman).
- (5) Arthropod transmission of viral, protozoan, and helminthic agents (Dr. Frothingham, Dr. Pan, and Dr. Spielman).

## Department of Health Services Administration

ALONZO S. YERBY, S.B., M.D., M.P.H., Professor of Health Services Administration, Head of the Department, and Director of the Interfaculty Program on Health and Medical Care

\*ALFRED L. FRECHETTE, M.D., M.P.H., Clinical Professor of Public Health Practice; *Commissioner of Public Health, Commonwealth of Massachusetts*

\*ELIZABETH P. RICE, A.B., S.M., Associate Professor of Public Health Social Work

MARJORIE A. C. YOUNG, S.B., ED.M., M.P.H., DR.P.H., Associate Professor of Health Education

WILLIAM L. CLAFF, A.B., M.B.A., Lecturer on Administration and Administrative Assistant to the Dean

ARTHUR R. JACOBS, A.B., M.D., M.P.H., Assistant Professor of Public Health

\*HAROLD W. DEMONE, JR., A.B., A.M., PH.D., Lecturer on Social Welfare; *Executive Director, The Medical Foundation, Inc.*

\*EDWARD B. KOVAR, A.B., A.M., Lecturer on Community Health Planning; *Director, Health, Hospitals and Medical Care Division, United Community Services*

\*SAMUEL LEVEY, A.B., A.M., A.M., PH.D., S.M. IN HYG., Lecturer on Hospital Administration; *Director, Division of Nursing Homes and Related Facilities, Massachusetts Department of Public Health*

\*HARRY T. PHILLIPS, M.B., CH.B., D.P.H., M.D., Lecturer on Health Services Administration; *Chief of Bureau of Chronic Disease Control, Massachusetts Department of Public Health, and Superintendent, Lemuel Shattuck Hospital*

A. GERALD RENTHAL, A.B., M.D., M.P.H., Instructor in Health Services Administration

\*HENRY WECHSLER, A.B., A.M., PH.D., Instructor in Social Psychology; *Research Director, The Medical Foundation, Inc.*

\*JOSEPH A. YACOVONE, A.B., D.M.D., M.P.H., Instructor in Dental Public Health; *Chief, Division of Dental Public Health, Rhode Island Department of Health*

\* Part-time in the School of Public Health.

## SCHOOL OF PUBLIC HEALTH

The following members of other Harvard Faculties participate in teaching in the Department of Health Services Administration:

JAMES M. DUNNING, A.B., D.D.S., M.P.H., Professor *and* Head, Department of Ecological Dentistry, Harvard School of Dental Medicine

OSLER L. PETERSON, M.B., M.D., M.P.H., Visiting Professor of Preventive Medicine, Harvard Medical School *and* Member of the Faculty of the Graduate School of Public Administration

CARL M. STEVENS, A.B., A.M., PH.D., Visiting Professor in Economics, Faculty of Arts and Sciences

CURTIS P. McLAUGHLIN, A.B., M.B.A., D.B.A., Assistant Professor of Business Administration, School of Business Administration

GERALD D. ROSENTHAL, A.B., S.M., PH.D., Assistant Professor of Economics, Faculty of Arts and Sciences

WILLIAM J. CURRAN, LL.B., LL.M., S.M. IN HYG., Lecturer on Legal Medicine, Harvard Law School; *Dean-Director, Metrocenter and Metropolitan College, Boston University*

SIDNEY S. LEE, S.B., M.D., M.P.H., DR.P.H., Lecturer on Preventive Medicine, Harvard Medical School *and* Associate Dean of the Faculty of Medicine for Hospital Programs

VICTOR W. SIDEL, A.B., M.D., Associate in Preventive Medicine, Harvard Medical School; *Assistant in Medicine and Chief, Preventive Medicine Unit, Massachusetts General Hospital*

RALPH E. BERRY, JR., A.B., A.M., PH.D., Instructor in Economics, Faculty of Arts and Sciences

ROBERT C. BUXBAUM, A.B., M.D., Instructor in Preventive Medicine, Harvard Medical School; *Assistant Director for the Medical Clinics, Peter Bent Brigham Hospital*

Our contemporary health systems are in a dynamic state of change. Increasingly, health is considered to be a basic human right. Government is more and more being thrust into the health field, for the benefit of both the individual and the community. The increasing complexity of medical technology calls for diverse types of health organizations. This vast growth of organized health services has created an increased need for qualified administrators and researchers.

With the projection of the hospital into community health services and the health department into personal care services, a specialized field of health services administration is emerging. Leadership and research are required to ensure high quality service to both the individual and the community. Health professionals must do more than just provide service, they must be concerned with policy formation, administration, and research. One of the main goals



## HARVARD UNIVERSITY

of the Department of Health Services Administration is to provide this education for leadership in health service organizations. Of equal importance is the extensive program of research which is being conducted at this School.

The important roles of government, voluntary agencies, and pre-payment insurance systems are also coming to the fore. In order to allow the potential health leader to meet the challenges of future change, the principles and techniques of planning, evaluation, and research are emphasized. Traditional administrative techniques such as budget preparation, personnel management, and supervision are also treated. Since there are many problems broad in scope which must be studied, the resources of multiple disciplines and several Harvard faculties are carefully integrated into the program.

Since health services administration is fundamentally concerned with the physician and the hospital, the Department maintains close liaison relationships with Harvard Medical School and with several Harvard University affiliated hospitals. Thus, to the Harvard School of Public Health's expertise in community health, preventive medicine, and research are added the resources of medical education, university hospitals, and the discipline of hospital administration. Just as the Medical School and the hospitals make important contributions to the training of leaders for health organizations, the School of Public Health, in turn, makes significant contributions to medical education and hospital administration. Since the teaching of health services administration also involves training in business administration, economics, and sociology, liaison relationships have been developed between the School and the Harvard School of Business Administration, the Department of Economics, and the Department of Sociology of Harvard University. One other important element of community health services training is provided by the mutually beneficial and long standing relationship with the Massachusetts Department of Public Health.

### Health Services Administration 1a,b. Provision of Health Services and Medical Care

Lectures and discussions. *Mondays and Wednesdays, 1:30-3:30, first period; Wednesday, 1:30-3:30, and Saturdays, 8:30-10:30, second period.* Dr. YERBY, Dr. SCHMIDT, and Staffs of the Departments.

Credit 4 units.

Required of Master of Public Health candidates.

This course is offered jointly by the Department of Health Services Administration and the Department of Maternal and Child Health and forms the basis for additional courses in both departments. It emphasizes basic concepts essential in the planning, organization, and administration of government and private health programs for all age groups.

Among the subjects discussed are legal, sociocultural, and economic factors

which affect the provision of health and medical care services; internal management of health agencies; characteristics of health agency interrelationships; health manpower requirements; and planning for medical care services.

#### **Health Services Administration 2b,c,d. Departmental Seminar**

Seminars. *Mondays, 1:30–3:30, second period. One two-hour session each week, third and fourth periods. Staff of the Department.*

Credit 3 units.

This course, primarily for students specializing in Health Services Administration, is concerned with selected topics for organization and operation of health programs. Discussions include reviews of research or demonstrations in progress, special projects of current interest, new programs being implemented, as well as reviews of significant current literature in the field. Staff and visiting lecturers participate.

#### **Health Services Administration 3c,d. Techniques in Organization and Administration of Health Services**

Seminars. *Two two-hour sessions each week, third and fourth periods. Dr. YERBY and Staff of the Department.*

Credit 4 units.

This course analyzes a number of areas important to health service policy-makers and administrators, including planning and decision-making processes, preparation of program plans and budgets, design of organizational structures, techniques of program supervision and control, management of personnel and financial resources, and research in administration. Case studies and exercises are used to focus discussion on public health practice.

#### **Health Services Administration 4c,d. Issues in Medical Care (Economics 285b)**

Seminars. *Two two-hour sessions each week, third and fourth periods. Dr. PETERSON, Dr. YERBY, Dr. STEVENS, Dr. ROSENTHAL, Dr. LEE, Dr. SIDEL, Dr. BUXBAUM, and Dr. RENTHAL.*

Credit 4 units.

This interdisciplinary course deals in depth with major issues in the economics and administration of medical care programs. It is designed for graduate students from the Schools of Public Health, Medicine, Business Administration, and Public Administration, and the Department of Economics. Seminars are conducted by the Interfaculty Committee on Health and Medical Care composed of representatives from the participating Schools. It is built on the foundations provided in the basic course, Provision of Health Services and Medical Care, 1a,b, offered in the first and second periods.

## HARVARD UNIVERSITY

During the first section of the course, major issues concerning resources, organizational structure, methods of payment, and the need and demand for medical care are examined. Among the considerations explored are the organization of medical practice and health services, changing requirements for health manpower and facilities, quantitative and qualitative standards for medical care, and factors influencing the utilization, efficiency, and cost of medical care in the United States and other countries. Special reading materials selected and prepared by the seminar staff serve as the basis for seminar discussions.

In the second section of the course, emphasis is on analysis, planning, and decision making through the use of case studies on specific programs and problems in medical care. The subjects covered include government health plans; cost, utilization, structure, and quality of personal health services; and organizational and manpower problems in medical care programs.

### **Health Services Administration 5c,d. Health Education**

Seminars. *One two-hour session each week, third and fourth periods.* Dr. YOUNG.

Credit 2 units.

This course emphasizes major aspects of learning theory, communication theory, educational methods, and health behavior; health education in the process of social change; psychosocial and cultural factors relevant to the planning of health education programs; and research and evaluation in health education. The major focus of the course is on health education aspects of community health programs, including school health services.

### **Health Services Administration 6d. Legal Problems of Organized Health Programs**

Seminars. *One two-hour session each week, fourth period.* Professor CURRAN.

Credit 1 unit.

This course is designed for students who are particularly interested in the legal aspects of health programs.

Seminars include discussions of constitutional problems in public health programs, the legislative process, professional and legal standards for the health professions and in research, general considerations of administrative law, regulation making by health organizations, legal reforms in personal injury litigation, and the presentation of expert medical testimony.

### **Health Services Administration 7c,d. Dental Public Health Practice**

Seminars and field visits. *One two-hour session each week, third and fourth periods.* Dr. Dunning and Dr. Yacovone.

Credit 2 units.

This seminar course is designed for dentists and for those of other disciplines who desire training in depth in the administration and planning of dental health programs. All phases of dental public health are covered including dental needs, resources, surveying, dental health education, fluoridation, prepayment, and evaluation of programs. Reading assignments are used to stimulate class discussion. Participants make field trips to several dental facilities. Students may elect to do advanced work in any phase of dental public health.

### **Health Services Administration 8c,d. Health and Economic Development**

Lectures and discussion. *One two-hour session each week, third and fourth periods.* Dr. BERRY.

Credit 2 units.

This interdisciplinary course, focusing on the issues of economic development and health planning, is designed for students who have particular interest in the less developed nations.

The course provides the student with an introduction to economic analysis, the process of economic development, and the interrelationship of health and economic development. Topics considered include theories of economic development, economic planning, economic development in historical perspective, the current planning problems of the less developed countries, and the significance of health, human capital, and population to economic development. Problems of health planning in less developed countries and approaches to the integration of health planning and economic planning are discussed.

### **Health Services Administration 9a,b. Economics of Medical Care (Economics 285a)**

Seminars. *Tuesdays, 2-4, first and second periods.* Dr. STEVENS, Dr. ROSENTHAL, and Dr. BERRY.

Credit 2 units.

This is an advanced interdisciplinary course for doctoral candidates at the schools and departments associated in the Interfaculty Program—the Schools of Public Health, Medicine, Public Administration, Business Administration, and the Department of Economics—and for students with advanced standing at the School of Public Health.

The course is concerned with the application of the analytic framework and methodology of economics to a number of specific problems in the broad area of medical care. The emphasis is on the techniques of analysis and statistical measurement, and no attempt is made to treat the entire field of medical care comprehensively. Seminar faculty and faculty members of other institu-



## HARVARD UNIVERSITY

tions are invited to present their research findings on specific problems for critical examination by the group. Advanced students who are conducting research in medical care are also expected to report on their studies for discussion by the group.

The course is planned to increase students' substantive knowledge of the problems discussed and to develop their familiarity with concepts and techniques useful in the examination and solution of issues in the economics and administration of medical care.

### **Health Services Administration 10c,d. Administrative Problems in Medical Care**

Seminars. *One two-hour session each week, third and fourth periods.* Dr. McLAUGHLIN, Dr. PETERSON, and other Members of the Harvard University Interfaculty Committee on Health and Medical Care.

Credit 2 units.

This is an advanced interdisciplinary course for doctoral candidates at the Schools and Departments associated in the Interfaculty Program, which includes students from Schools of Public Health, Medicine, Public Administration, Business Administration, and the Department of Economics.

The course is concerned with the application of administrative concepts and techniques, such as organizational theory, decision theory, operations research, and systems analysis, to a variety of actual problems in medical care. Seminar faculty and faculty members of other institutions are invited to present their research findings on these problems for critical examination by the group. Students who are specializing in medical care are also expected to report on their studies for discussion by the group.

The course is designed to further increase students' substantive knowledge of the problems discussed and to develop their familiarity with concepts and techniques useful in the examination and solution of issues in the economics and administration of medical care.

### **Health Services Administration 17a,b,c,d,e. Tutorial Program**

*Time and credit to be arranged.*

Master's degree candidates may make arrangements to do individual and group work under the guidance of a staff member of the Department.

This work can include readings and special projects in such areas as dental health, medical care, and health education. In addition, field assignments to federal, state and local government and private health organizations can be arranged.

### **Health Services Administration 20. Research**

Doctoral candidates are offered the opportunity of undertaking individual study and research as the basis for a doctoral thesis.

Health Services Administration 30e. Assignments to Field Agencies

*January 30 — February 4, 1967.*

Credit 1 unit.

Students are assigned to work in the field on special projects, on group surveys or other types of field projects, or for observation of, and limited participation in, the work of health agencies.

Field assignments are made on an individual basis to meet the special needs of each student insofar as possible. Work in the field is coordinated with courses in the Department.

## Department of Maternal and Child Health

WILLIAM M. SCHMIDT, S.B., M.D., A.M. (hon.), Professor of Maternal and Child Health and Head of the Department

JACOB J. FELDMAN, PH.D., Associate Professor of Biostatistics

\*ELIZABETH P. RICE, A.B., S.M., Associate Professor of Public Health Social Work

\*LEON STERNFELD, S.B., M.D., PH.D., M.P.H., Associate Professor of Applied Maternal and Child Health; *Deputy Commissioner and Director of Local Health Services, Massachusetts Department of Public Health*

ISABELLE VALADIAN, M.D., M.P.H., Associate Professor of Maternal and Child Health

JAMES E. TEELE, A.B., A.M., PH.D., Assistant Professor of Sociology

\*EDWIN M. GOLD, S.B., M.D., Visiting Lecturer on Maternal and Child Health; *Professor of Obstetrics and Gynecology and of Preventive Medicine, New York Medical College*

\*ARTHUR J. LESSER, A.B., M.D., M.P.H., Visiting Lecturer on Maternal and Child Health; *Deputy Chief, Children's Bureau, United States Department of Health, Education and Welfare*

\*HELEN D. COHN, M.P.H., Instructor in Applied Public Health Nursing; *Assistant Professor of Public Health Nursing, Boston University School of Nursing*

\*ILSE E. GORBACH, A.B., M.D., M.P.H., Instructor in Maternal and Child Health

\*BENJAMIN SACHS, A.B., M.D., M.P.H., Instructor in Maternal and Child Health; *Health Commissioner, Cambridge Health Department and Regional Director, Massachusetts Department of Public Health*

ALFRED YANKAUER, A.B., M.D., M.P.H., Senior Research Associate in Maternal and Child Health

\*RUTH M. BUTLER, A.B., S.M., Research Associate in Social Work; *Professor of Human Behavior and Social Environment, Boston College School of Social Work*

LEO MILLER, A.B., S.M. IN S.S., M.P.H., PH.D., Research Associate in Social Work

CHARLYNE D. COSTIN, A.B., M.S.S.W., Assistant in Social Work

\* Part-time in the School of Public Health.

\*RUTH A. COWIN, S.B., S.M., Assistant in Social Work

MIRIAM C. EKDAHL, S.B., S.M. IN S.S., Assistant in Social Work

CARMINA M. GORDON, B.A., B.S.W., M.S.W., Assistant in Social Work

MARGARET B. HOFF, A.B., S.M., Assistant in Biostatistics and Maternal and Child Health

GERTRUDE MCCARTHY, S.B., S.M., Assistant in Social Work

The following individuals who hold appointments in Harvard Medical School participate in teaching in the Department of Maternal and Child Health

CHARLES A. JANEWAY, A.B., M.D., A.M. (hon.), *Thomas Morgan Rotch Professor of Pediatrics*

DUNCAN E. REID, S.B., M.D., A.M. (hon.), *William Lambert Richardson Professor of Obstetrics*

CLEMENT A. SMITH, A.B., A.M., M.D., A.M., (hon.), S.D. (hon.), *Professor of Pediatrics at the Boston Lying-In Hospital*

WILLIAM BERENBERG, A.B., M.D., *Assistant Clinical Professor of Pediatrics*

ROBERT B. BERG, A.B., M.D., *Assistant Professor of Pediatrics at Beth Israel Hospital*

JOEL J. ALPERT, A.B., M.D., *Associate in Pediatrics*

LONDON SNEDEKER, A.B., M.D., M.P.H., *Instructor in Pediatrics*

Maternal and Child Health Services, including Services for Handicapped Children, are seen as a part of the total public health program, national and local, and are discussed in terms of integration with related health services and medical care for all segments of the population. The Staff of the Department is responsible, together with the Department of Health Services Administration, for the presentation of the course, Provision of Health Services and Medical Care, which is required of Master of Public Health degree candidates and which may be elected by other students with the consent of the Instructor. (See page 112 for a description of this course.)

More intensive study of health problems in the field of Maternal and Child Health and of the aspects of programs and special methods which have been developed to serve mothers and children is offered in the Departmental seminars. Additional elective seminars are directed to research methods in growth and development, problems of adolescence, and welfare programs and their relation to public health.

Fellowships are available for students who have a major interest in Maternal and Child Health (see page 165). Candidates concentrating in Maternal and Child Health are normally expected to take the following courses in addition to satisfying the course requirements for the degree:



## HARVARD UNIVERSITY

Maternal and Child Health 2b

Maternal and Child Health 3c,d

Maternal and Child Health 17b,c,d,e

Maternal and Child Health 30

### Maternal and Child Health 2b. Departmental Seminar

Seminars. *Mondays, 1:30-3:30, second period.* Dr. SCHMIDT and Staff of the Department.

Credit 1 unit.

This course is designed primarily for students concentrating in Maternal and Child Health. Selected aspects of programs which relate to mothers and children are examined with particular reference to the methods of administration in relation to the program goals.

### Maternal and Child Health 3c,d. Problems and Programs in Maternal and Child Health

Seminars. *Two two-hour sessions each week, third and fourth periods.* Dr. SCHMIDT, Associate Professor RICE, Dr. VALADIAN, and Staff of the Department.

Credit 4 units.

This course develops in greater depth the related subject matter introduced in the course, Provision of Health Services and Medical Care. (See page 112.) It includes presentation and discussion of programs in maternal and child health, services for handicapped children, related social problems, and available social services for mothers and children. During the fourth period sessions will be devoted to discussion of research and demonstrations, legislative developments, and to reports of students' projects, Maternal and Child Health 17b,c,d,e.

### Maternal and Child Health 4c. Welfare Programs and Their Relation to Public Health

Seminars. *One two-hour session each week, third period.* Associate Professor RICE.

Credit 1 unit.

This seminar course includes presentation and discussion of the evolution of public welfare services, with emphasis on the development of public welfare philosophy, principles, and programs. Although it is primarily focused on public welfare in the United States, reference is made to contrasting patterns in other countries. Public attitudes as they affect public welfare policy are analyzed. The relationships of public welfare and public health and the complementary nature of their services are emphasized, including present

and potential methods of cooperation. Emphasis is placed on the present strengths and limitations of welfare programs and anticipated further developments.

**Maternal and Child Health 5d. Research Approach to Growth, Development and Health of the Child**

Seminars. *Two two-hour sessions each week, fourth period.* Dr. VALADIAN, Dr. REED and Staff of the Department.

Credit 2 units.

This course deals with methods of obtaining and evaluating data on child growth, development, and health, and the construction of norms. Particular attention is paid to problems involved in the study of interrelationships between various aspects of the child's progress and between the child and his background and environment.

Illustrative material is used from the Longitudinal Study of Child Health and Development conducted in this Department since 1930 by Dr. Harold C. Stuart, Professor *Emeritus*, as well as data from other studies in this country and abroad.

Enrollment is subject to the approval of the Instructor.

**Maternal and Child Health 6d. Adolescence and Youth: Sociological Concepts Related to Health Care**

Lectures and seminars. *One two-hour session each week, fourth period.* Dr. TEELE and Staff of the Department.

Credit 1 unit.

This course is developed around a multi-disciplined approach to adolescent and youth behavior in the United States and presents material on socio-psychological theories and research in the field. Emphasis is placed upon a review of social science research into socialization practices, adolescent culture, and adolescent problems, including health problems. Aspects of mental and physical illness in the adolescent population are also examined. The aim of the course is to introduce the student to the apparent social and health consequences for youth of earlier familial influences with respect to health care, health attitudes, and child-rearing practices. In addition, the relationship of the structure of society to the growth and development of children and youth is considered.

**Maternal and Child Health 17b,c,d,e. Tutorial Program**

*Time to be arranged, second, third and fourth periods.*

Credit 2 or more units.

With advance approval by the Head of the Department, individual work

## **HARVARD UNIVERSITY**

under guidance may be arranged between the student and the adviser. Enrollment must be made during the first semester.

### **Maternal and Child Health 20. Research**

Students at the doctoral level may undertake research in Maternal and Child Health by arrangement with the Head of the Department.

### **Maternal and Child Health 30. Field Studies**

1. January 30–February 4, 1967

Credit 1 unit.

A field study in Puerto Rico is arranged in cooperation with the Department of Maternal and Child Health of the University of Puerto Rico, School of Medicine, Division of Preventive Medicine and Public Health. The work of the week is devoted mainly to an observation of Maternal and Child Health activities, including programs for handicapped children and family planning services.

Consent of the Head of the Department is required for admission to this course. Enrollment must be made by the end of the first period. (See page 160 for an estimate of the cost.)

2. Other field experiences may be taken for credit during the year as time permits.

3. Students whose special field of interest is Maternal and Child Health and who do not have sufficient previous experience will be encouraged to have a period of field study before registration. Field study may also be undertaken after the completion of the academic year in a program arranged by the Staff of the Department. No credit.

## Department of Nutrition

FREDRICK J. STARE, S.B., S.M., PH.D., M.D., A.M. (hon.), S.D. (hon.), D.SC. (hon.),  
Professor of Nutrition *and* Head of the Department

D. MARK HEGSTED, S.B., S.M., PH.D., A.M. (hon.), Professor of Nutrition

JEAN MAYER, B.A., B.SC., M.SC., PH.D., D.SC., A.M. (hon.), Professor of Nutrition  
*and* Lecturer on the History of Public Health

STANLEY N. GERSHOFF, A.B., S.M., PH.D., Associate Professor of Nutrition

ROBERT P. GEYER, S.B., S.M., PH.D., Associate Professor of Nutrition

STEPHEN B. ANDRUS, S.B., M.D., Assistant Professor of Pathology (Absent  
1966-67)

\*HARRY N. ANTONIADES, B.S., PH.D., Assistant Professor of Biochemistry; *Senior Investigator, The Protein Foundation, Inc.*

MANUEL G. HERRERA-ACENA, A.B., M.D., Assistant Professor of Medicine

BERNARD LOWN, S.B., M.D., Assistant Professor of Medicine

ROBERT B. MCGANDY, A.B., M.D., M.P.H., Assistant Professor of Nutrition

CLIFTON A. BAILE, S.B., PH.D., Instructor in Nutrition

MADGE L. MYERS, A.B., S.M., Instructor in Nutrition

PATRICIA S. REMMELL, S.B., S.M., Instructor in Nutrition

HECTOR A. CASTELLANOS, B.SC., B.MED., M.D., Research Associate in Nutrition

CARL C. SELTZER, A.B., PH.D., Research Associate in Physical Anthropology

MARIA BANASIEWICZ, M.D., M.P.H., Research Associate in Nutrition

JEANNETTE H. FORSYTH, A.B., PH.D., Research Associate in Nutrition

WILLIAM B. HOOD, JR., S.B., M.D., Research Associate in Medicine

AGNES M. HUBER, B.SC., PH.D., Research Associate in Nutrition

MICHAEL C. LATHAM, B.A., M.D., D.T.M. & H., M.P.H., Research Associate in Nutrition

MARY B. McCANN, S.B., M.P.H., M.D., Research Associate in Nutrition

HARRY L. McCOMBS, S.B., M.D., Research Associate in Pathology

\*JOSEPH M. MILLER, A.B., M.D., M.P.H., Research Associate in Medicine; *Associate in Medicine, Peter Bent Brigham Hospital and Medical Director, Massachusetts Bay Transportation Authority*

F. RUSSELL OLSEN, A.B., Research Associate in Nutrition

\*HEDWIG ELIZABETH ROSE, M.B., CH.B., Research Associate in Pediatrics; *Assistant School Physician, Town of Brookline*

\* Part-time in the School of Public Health.



## HARVARD UNIVERSITY

\*HERNAN VELEZ, M.D., Clinical Research Associate in Nutrition; *Associate Professor of Internal Medicine, School of Medicine, University of Medellin, Colombia*

NORBERT L. WIECH, S.B., S.M., PH.D., Research Associate in Nutrition

CHARLES E. ELSON, S.B., S.M., PH.D., Research Fellow in Nutrition

ALI M. FAKHRO, M.D., Research Fellow in Nutrition

SAMUEL B. ITSCHOITZ, M.D., Research Fellow in Nutrition

ELIESER KAPLINSKY, M.D., Research Fellow in Nutrition

ARTHUR W. MAHONEY, S.B., PH.D., Research Fellow in Nutrition

BRIAN MCCARTHY, B.AGR.SC., M.AGR.SC., PH.D., Research Fellow in Nutrition

GUY J. ROBERGE, A.B., M.D., Research Fellow in Nutrition

CARLOS E. VASSAUX, B.S., M.D., Research Fellow in Nutrition

AMNON WACHMAN, S.B., M.D., Research Fellow in Nutrition

STEPHEN M. WITTENBERG, A.B., M.D., Research Fellow in Nutrition

ETHEL J. BOWIE, S.B., Assistant in Nutrition

DOROTHY BRUNO, S.B., Assistant in Nutrition

SHEILA N. CRONIN, S.B., S.M., Assistant in Nutrition

JANE A. SCHOONMAKER, S.B., S.M., Assistant in Nutrition

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JAMES H. SHAW, B.A., S.M., PH.D., A.M. (hon.), *Professor of Nutrition, Harvard School of Dental Medicine*

IRA GORE, A.B., M.D., *Lecturer on Pathology, Harvard Medical School*

DANIEL S. BERNSTEIN, A.B., M.D., *Associate in Medicine, Harvard Medical School*

RONALD D. HUNT, S.B., D.V.M., *Research Associate in Pathology, Harvard Medical School*

The Department of Nutrition is concerned with basic and applied investigations in the science of nutrition in the areas of biochemistry, physiology, pathology, and psychology. Many of these are oriented toward problems of contemporary public health importance, such as cardiovascular diseases, obesity, and cancer. The Department also has programs dealing with general nutritional and health problems in various countries in South America, Africa, and Asia.

In addition to the courses available in the School of Public Health, students may take graduate courses in the other Schools of Harvard University and at the Massachusetts Institute of Technology. Thus, a program leading to the Doctor of Science degree might include courses in nutrition, biochemistry, biostatistics and epidemiology, physiology, and bacteriology, as well as ad-

vanced courses in these and related fields, such as organic and physical chemistry and biology. Appropriate programs are available for individuals whose interests lie in community nutrition rather than in laboratory nutrition and biochemistry.

Candidates for the Master of Public Health degree who elect to concentrate in Nutrition are normally expected to take the following courses in addition to satisfying the formal course requirements for the degree:

Nutrition 1a,b and at least one other course offered by the Department of Nutrition.

### **Nutrition 1a,b. Public Health Nutrition**

Lectures. *Wednesdays, 8:30-9:30, first and second periods.* Dr. STARE, Dr. GERSHOFF, and Dr. McGANDY.

Credit 1 unit.

Required of Master of Public Health candidates.

This course deals with the science of nutrition and its application to problems of human nutrition such as atherosclerosis, obesity, and metabolic disorders. Nutrition surveys and their evaluation, methods for establishing and meeting nutritional requirements, especially in countries with unfavorable economic conditions are discussed. The etiology, treatment and prevention of disorders related to nutrition are considered.

### **Nutrition 2b,c,d. Departmental Seminar**

Seminars. *Mondays, 1:30-3:30, second, third and fourth periods.* Staff of the Department.

Credit 3 units.

Students are expected to summarize and criticize recent publications on assigned topics in nutrition. Attention is placed on validity of experimental designs in nutritional research. Topics include the biochemical, physiological, psychological, and sociological aspects of nutrition.

### **Nutrition 3c,d. Advanced Topics in Nutrition**

Lectures, discussions and required reading. *One two-hour session each week, third period; two two-hour sessions each week, fourth period.* Dr. HEGSTED, Dr. MAYER and Dr. GERSHOFF.

Credit 3 units.

The nutritional aspects of metabolism of carbohydrates, fats, proteins, vitamins, and essential minerals are considered in detail. Mechanisms of regulation and behavioral aspects of food and fluid intake, calorimetry, genetic factors in nutrition, comparative requirements of various species are examined.

This course is intended primarily for students majoring in nutrition but

## HARVARD UNIVERSITY

can be taken by other adequately prepared students by the consent of the Instructors.

### Nutrition 4c,d. Laboratory Techniques

Lectures and demonstrations. *One two-hour session each week, third and fourth periods.* Dr. GEYER and Dr. ANTONIADES.

Credit 2 units. Additional credits can be arranged for those desiring extra laboratory instruction.

This course is a survey of methods pertinent to laboratory research. The material covered includes biophysical and chemical techniques. Students participate in laboratory exercises on such general topics as chromatography, spectroscopy, microbiological assay, manometric measurements, and purified diet techniques. They are then instructed in the actual laboratory procedure pertaining to these techniques.

Prerequisite: A basic course in Biochemistry.

Enrollment is subject to the approval of the Instructor.

### Nutrition 5d. Nutritional Surveys

Lectures, discussions and laboratory exercises. *One two-hour session each week, fourth period.* Dr. GERSHOFF and Dr. MCGANDY.

Credit 1 unit.

Methods of obtaining dietary information, principles of nutritional surveys; assessment of nutritional status in public health programs and clinical research are examined and discussed. Laboratory work consists of practical exercises in evaluating diets and surveys.





### **Nutrition 6c,d. Nutritional Aspects of Human Disease**

Lectures, discussions and demonstrations. *One two-hour session each week, third and fourth periods.* Dr. HERRERA-ACENA, Dr. LATHAM, and Dr. MILLER.

Credit 2 units.

This course considers in detail the application of current nutritional knowledge to areas of clinical medicine where nutritional deficiency or dietary management is of major importance. The assessment of nutritional status, the diagnosis and management of common deficiency diseases, and the role of nutrition in the etiology and treatment of the chronic and degenerative diseases are discussed.

### **Nutrition 17a,b,c,d,e. Tutorial Program**

*Time and credit to be arranged.*

Individual work, under direction, may be arranged for students at the master's level. This may include laboratory studies or projects in applied nutrition.

### **Nutrition 20. Research**

*Time and credit to be arranged.*

Facilities are available for students at the doctoral level to do advanced work in nutrition along the lines of fundamental research or applied nutrition in public health and medicine. Areas currently receiving intensive and comprehensive study in the Department are as follows:

The effect of nutrition and other environmental factors on the etiology of heart disease in man; nutrition education; fluoride in human nutrition as a preventive for tooth decay and osteoporosis; cooperative international researches in nutrition. (Dr. STARE)

The nutritive value of proteins and protein requirements; dietary effects on the metabolism of cholesterol in animals and man; the influence of diet on the metabolism of adipose tissue; nutritional requirements for calcium and for bone formation. (Dr. HEGSTED)

Neurophysiological and metabolic aspects of the regulation of food and fluid intake in monogastric animals and ruminants; studies of feeding in rodents, ruminants, and primates; experimental obesity; anthropological, metabolic, and behavioral studies of obesity in children and adolescents; psychological aspects of nutrition in man. (Dr. MAYER)

Lipid metabolism in tissue culture cells; polyvalent metal metabolism in soft tissue; effects of CO<sub>2</sub> deprivation on tissue culture cells. (Dr. GEYER)

The effects of nutritional deficiencies on endocrine metabolism; the etiology of urolithiasis in experimental animals and man; vitamin metabolism; interrelationships between nutrition and endocrine function. (Dr. GERSHOFF)



## HARVARD UNIVERSITY

Coronary artery disease; etiology of sudden death; derangements of the heart beat; exercise physiology; electrolyte metabolism. (Dr. LOWN)

Clinical and experimental studies on circulating lipids and atherosclerosis. (Dr. MCGANDY)

Protein isolation and characterization; hormone biochemistry and metabolism. (Dr. ANTONIADES)

Endocrine, nutritional, and metabolic aspects of diabetes. (Dr. HERRERA-ACENA)

Admission is limited and is subject to the approval of the Instructor.

## **Department of Behavioral Sciences**

ALEXANDER H. LEIGHTON, A.B., A.M., M.D., Professor of Social Psychiatry *and* Head of the Department

SYDNEY H. CROOG, A.B., A.M., PH.D., Assistant Professor of Sociology

JANE M. MURPHY, A.B., PH.D., Assistant Professor of Anthropology

MORTON BEISER, M.D., Lecturer on Social Psychiatry

DAVID S. SHAPIRO, A.B., PH.D., Lecturer on Social Psychiatry

\*RODERICK A. ARMSTRONG, B.A., L.M., S.S.A., Research Consultant in Social Psychiatry; *Executive Director, Digby-Annapolis Mental Health Service Board, Inc.*

ROBERT A. DANLEY, A.B., S.M., PH.D., Research Associate in Sociology

\*A. PHILIP CONNELLY, JR., A.B., M.D., Research Associate in Medicine; *Assistant Physician, University Health Services*

NICHOLAS FREYDBERG, S.B., PH.D., Research Associate in Social Psychology

ALICE L. NANGERONI, A.B., Research Associate *and* Administrative Assistant in Behavioral Sciences

JAY H. NOLAN, A.B., A.M., Research Associate in Anthropology

VICTOR G. CARDOZA, Field Project Administrator

AMORITA C. SUAREZ, S.B., Assistant in Behavioral Sciences

The Department of Behavioral Sciences, a recent addition to the Harvard School of Public Health, begins its teaching program in the autumn of 1966. The focus of the program is on the relationship of social environment to mental illness and mental health. Allied to this is a concern with social and cultural processes as they affect the working of public health programs and the interrelationships of these programs with other aspects of community development and change.

The teaching deals with the essentials of what has been discovered about the functioning of human social systems and with the central findings of social psychiatry. Considerable emphasis is given to research and research methods. Courses cover such topics as psychiatric epidemiology, the mental health movement, cross-cultural psychiatry, personality development, the human community, medical sociology, and the role of cultural factors in health and disease.

Students who major in the Department will have an opportunity to participate in a variety of research projects. These include surveys to ascertain the

\* Part-time in the School of Public Health.

## HARVARD UNIVERSITY

prevalence of psychiatric disorders in selected populations, investigations of adjustment to stress, cross-cultural comparisons, and studies of the effects of rapid cultural change and of social disintegration. In addition to a concern with building significant theory, the Department gives major weight to the development of method, the revision of concepts, and the testing of reliability and validity.

### **Behavioral Sciences 1a. The Human Community**

Lectures and discussions. *Saturdays, 10:30-12:30, first period.* Dr. LEIGHTON and Staff of the Department.

Credit 1 unit.

Required of Master of Public Health candidates.

Comprehension of health problems and implementation of health programs depend upon understanding the forms and forces active in community life. This course of instruction deals with the social and cultural characteristics of human populations, the organization and behavior of human communities, and their relationship to the environment. The objective of the course is to provide a knowledge of, and a set of concepts dealing with, human populations, interpersonal relationships, cultural values, and social organization, in preparation for the study of public health.

### **Behavioral Sciences 1b. Mental Health and Mental Illness**

Lectures and discussions. *Saturdays, 10:30-12:30, second period.* Dr. LEIGHTON and Staff of the Department.

Credit 1 unit.

Required of Master of Public Health candidates.

This course in public health psychiatry is designed to give students a frame of reference for understanding relationships between psychiatric disorders and environmental processes.

The focus of the course is on theories of personality, social class, cultural change and sociocultural disintegration. Current research findings are reviewed and implications for practice and planning discussed. The history and present status of the mental health movement with attendant legislation are summarized.

### **Behavioral Sciences 2b. Departmental Seminar**

Seminars. *Mondays, 1:30-3:30, second period.* Dr. LEIGHTON and Staff of the Department.

Credit 1 unit.

This course amplifies, and advances more deeply into, selected areas covered in Behavioral Sciences 1a,b. While emphasis is given to the current research

being conducted by departmental members, there is latitude for accommodating the interests of particular students.

**Behavioral Sciences 3c. Cross-Cultural Psychiatry**

Lectures and Seminars. *One two-hour session each week, third period.* Dr. MURPHY.

Credit 1 unit.

This course is designed for public health workers who desire to increase their knowledge regarding mental health and mental illness in contrasting cultural groups. The ground covered includes cultural relativity, cross-cultural epidemiology of psychiatric disorders, and the effects of rapid cultural change, poverty, and sociocultural disintegration. Indigenous practices for the treatment of the mentally ill in non-Western societies are described and their implications discussed. Various contemporary experiments concerned with meeting the psychiatric needs of developing countries are examined.

Admission is subject to the approval of the Instructor.

**Behavioral Sciences 4c. Personality Development: A Public Health Viewpoint**

Seminars. *One two-hour session each week, third period.* Dr. BEISER.

Credit 1 unit.

Intended primarily for students with a major interest in both the applied and research aspects of community mental health, this course emphasizes the interaction of sociocultural factors with ontogenetic processes. Discussions are conducted about the implications of these processes and the rationale they provide for the amelioration and prevention of disorders. Relevant areas of research are also covered.

Admission is subject to the approval of the Instructor.

**Behavioral Sciences 5c. The Epidemiology of Psychiatric Disorders**

Seminars. *One two-hour session each week, third period.* Dr. LEIGHTON.

Credit 1 unit.

This course reviews present knowledge regarding the prevalence and incidence of psychiatric disorders with particular attention being paid to etiological questions and the problems of control. Attention is focused on main categories of disorders, such as psychosis, neurosis, brain syndrome, and mental deficiency. Particular emphasis is given to matters of conceptualization and methods which confront the advance of research in this field.

**Biostatistics and Behavioral Sciences 6c,d. Research Methods in Community Health**

Lectures and discussions. *Two two-hour sessions each week, third and*



## HARVARD UNIVERSITY

*fourth periods.* Dr. REED, Dr. FELDMAN and Staff of the Behavioral Sciences Department.

Credit 4 units.

This elective course, offered by members of the Biostatistics and Behavioral Sciences Departments, is intended primarily for doctoral candidates and other advanced students who require specialized preparation to conduct or administer scientific research on social and community aspects of health, health behavior and health organization. The merits of alternative research designs are covered by means of lectures, discussions of current research projects, and presentations of students' own research plans. Instruction covers a range of methods and techniques including survey methods, case and longitudinal studies, as well as relevant statistical techniques, methods of constructing and administering interviews, and other methods of data collection and analysis.

Enrollment is limited and is subject to the approval of the Instructor.

### **Behavioral Sciences 7d. Community Psychiatry and Mental Health**

Seminars. *One two-hour session each week, fourth period.* Dr. SHAPIRO.

Credit 1 unit.

This series of eight seminars deals with the development of community psychiatry and mental health, with particular reference to the interests of public health workers. Emphasis is placed upon program analysis and evaluation. Some sessions are devoted to lectures by representative mental health administrators from the national and local scene.

### **Behavioral Sciences 8c,d. Health and Illness in Cross-Cultural Perspective**

Seminars. *One two-hour session each week, third and fourth periods.* Instructor to be announced.

Credit 2 units.

This course is designed for public health students who seek greater familiarity with social and cultural aspects of health and illness in this and other countries, and for social science students interested in health and health services as a research area. Much of the course consists of lectures by experts who are conducting specific studies of a sociomedical nature, followed by informal class discussion.

Enrollment is subject to the approval of the Instructor

### **Behavioral Sciences 11c. The Assessment of Mental Health**

Laboratory. *One two-hour session each week, third period.* Dr. BEISER.

Credit 1 unit.

This course is concerned with training in a systematic technique for making psychiatric health ratings of individuals. It provides an opportunity to ac-

quire skill in a type of procedure that is fundamental to making surveys of communities. It also gives first-hand experience with some new ways of viewing mental illness that are emerging from social psychiatry.

Prerequisite: Two years of training in Psychiatry.

Enrollment is subject to the approval of the Instructor

**Behavioral Sciences 17a,b,c,d,e. Tutorial Program**

*Time and credit to be arranged.* Staff of the Department.

For departmental majors. Arrangements can be made for a reading course in selected topics or practical experience in research.

**Behavioral Sciences 20a,b,c,d. Research Training**

Training in research is available to doctoral candidates through individual arrangements with the Staff of the Department.

**Behavioral Sciences 30e. Field Study**

A limited number of openings exist for research experience in the Department's field stations. These opportunities vary in nature from time to time according to the stages of various research projects. Individual arrangements can be made through the Head of the Department.

## *Center for Population Studies*

**Roger Revelle, A.B., Ph.D., Sc.D. (hon.), A.M. (hon.),**  
**Richard Saltonstall Professor of Population Policy and**  
**Director of the Center**

HILTON A. SALHANICK, A.B., A.M., PH.D., M.D., Member of the Center for Population Studies; *Professor of Obstetrics and Gynecology, Harvard Medical School*

HAROLD A. THOMAS, JR., S.B., S.M., S.D., Member of the Center for Population Studies; *Gordon McKay Professor of Civil and Sanitary Engineering*

HARVEY LEIBENSTEIN, S.B., A.M., PH.D., Member of the Center for Population Studies; *Visiting Professor of Economics, Graduate School of Arts and Sciences* (through January 31, 1967)

ARTHUR J. DYCK, A.B., A.M., Member of the Center for Population Studies; *Assistant Professor of Social Ethics, Harvard Divinity School*

RALPH B. POTTER, JR., A.B., B.D., Member of the Center for Population Studies; *Assistant Professor of Social Ethics, Harvard Divinity School*

HELEN GIDEON, M.B., B.S., M.P.H., Research Associate in Population Studies (Absent 1966-67)

CONSTANTINA SAFILIOS-ROTHSCHILD, S.M., PH.D., Research Associate in Population Studies

VYTAUTAS I. UZGIRIS, A.B., S.B., M.D., PH.D., Research Associate in Population Studies

PAULINE S. WYCKOFF, A.B., Executive Secretary of the Center for Population Studies and Administrative Assistant to the Dean

WILMA E. WINTERS, S.B. IN ED., A.M., S.M., Librarian of the Center for Population Studies

The Center for Population Studies was established in 1964 under the leadership of the School of Public Health as a University-wide Center to help scholars and scientists in different fields join in a common attack on human population problems. The Members of the Center are concerned with teaching and research on the history, dynamics, and means of control of human population changes; the physiology of reproduction; the psychology and sociology of human fertility; interactions between resource development and population growth; questions of health, nutrition, education, and moral values related to population problems; and the biophysical and social environments of human populations.

## SCHOOL OF PUBLIC HEALTH

A Faculty Advisory Committee guides the operation and development of the Center. Seven of the Faculties of Harvard University are represented on this Committee: Arts and Sciences, Design, Divinity, Education, Medicine, Public Administration, and Public Health. The Faculty of the Center includes members of the Departments of Economics and Social Relations, the Division of Engineering and Applied Physics, and the Schools of Public Health, Medicine, and Divinity. Two headquarters are maintained, one in Boston in the School of Public Health, and one in Cambridge.

In the School of Public Health, the Department of Demography and Human Ecology, as an integral part of the Center for Population Studies, conducts a program of research and teaching on public health aspects of population problems. The Department welcomes qualified candidates for the various degrees offered by the School of Public Health who wish to concentrate on these problems. Elsewhere in the University, courses and seminars open to all qualified students are given by Members of the Center in the Departments of Economics and Social Relations, in the Medical School, and the Divinity School.

At present, the Center is supporting pre- and post-doctoral research in demography, public health and fertility control, human reproductive physiology, religious attitudes toward fertility control, relations between population growth and economic and social development, and the sociological problems related to changes in human fertility patterns. Several broad research projects are being initiated, both in the United States and overseas, and these will provide further opportunities for graduate, post-doctoral, and faculty research.



## ***Department of Demography and Human Ecology***

JOHN C. SNYDER, A.B., M.D., LL.D., Henry Pickering Walcott Professor of Public Health *and* Chairman of the Department

DIETER KOCH-WESER, M.D., S.M., PH.D., Associate Professor of Tropical Health and Human Ecology *and* Assistant to the Dean for Latin American Programs

JOHN B. WYON, B.A., M.B., B.CH., M.P.H., Senior Research Associate and Lecturer in Population Studies

WILLIAM H. FORBES, A.B., A.M., DR.PHIL., M.D., Lecturer on Physiology

DAVID M. HEER, A.B., A.M., PH.D., Assistant Professor of Biostatistics and Demography

STEPHEN J. PLANK, PH.B., A.B., M.D., M.P.H., DR.P.H., Assistant Professor of Population Studies

The advances of the past century in science, technology, and economic development have revealed unprecedented opportunities for improving the quality of life for much of mankind. Among these opportunities there are several in the field of public health which have been the basis for large-scale programs aimed at prevention and control of major diseases, such as malaria and smallpox. But the striking successes in reducing morbidity and mortality from epidemic diseases have not been consistently accompanied by improvement in the conditions of life. Moreover, the rapid expansion of population in many parts of the world is thwarting the current efforts to provide better housing, education, nutrition, health services and medical care. The disparity between rates of population increase and rates of development of human and economic resources is a crucial problem confronting society.

Acting under the conviction that the health professions can and should participate in general efforts to improve the quality of human life, the Harvard School of Public Health established the Department of Demography and Human Ecology in 1962. By this undertaking the School accepted the responsibility to include problems of human fertility and population growth among the basic factors affecting the health of people and therefore of major importance to success in providing comprehensive health services and medical care for communities and nations throughout the world.

The Department has developed courses of instruction in the biological and social processes which influence population change, in the current means available to control human fertility, and in the physiology of human reproduction. As the Department increases its resources these courses of instruction will be broadened considerably. The formal courses and the tutorial instruc-

tion of the Department are planned to prepare students for effective participation in population programs as administrators, research workers, or educators.

The courses of instruction listed below are those intended primarily for students enrolled in the Harvard School of Public Health, but may be elected by students in other parts of Harvard or by other qualified persons who fulfil the criteria for admission as special students.

Candidates for the Master of Public Health degree who elect to concentrate in Demography and Human Ecology are normally expected to take the following courses in addition to the general course requirements:

Demography 2b,c,d

Demography 4c,d

Demography 5c,d

Demography 30e

### **Demography and Human Ecology 1a. Population Growth and Fertility Control**

Lectures and seminars. *Saturdays, 8:30–10:30, first period.* Dr. PLANK and Staff of the Department.

Credit 1 unit.

Required of Master of Public Health candidates.

Major consideration is given to population growth and to the means of controlling fertility in the context of public health programs. Concepts of ecology are developed to provide an understanding of the relationships between human populations and their environments. The physical, biological, and social forces which influence the demographic characteristics of a population are considered. Techniques for measuring these forces are presented, and their historical trends and future prospects are assessed.

### **Demography and Human Ecology 2b,c,d. Departmental Seminar**

Seminars. *Mondays, 1:30–3:30, second, third and fourth periods.* Dr. SNYDER and the Staff of the Department.

Credit 3 units.

This course is oriented toward the research interests of those concentrating in the department. Each student selects a topic for special study on which he first presents a critical survey of the relevant literature and later the design of a project which would provide new information. During the initial sessions, and on occasion thereafter, staff members and guests report on their own investigations.

With the permission of the Instructor, students may elect Demography and Human Ecology 2c,d without having taken 2b.

## HARVARD UNIVERSITY

### Demography and Human Ecology 3c. Demographic Techniques

Lectures. *One two-hour session and one one-hour session each week, third period.*

Laboratory. *One two-hour session each week, third period.* Dr. HEER.

Credit 2 units.

A course on demographic techniques with emphasis on the correction of vital statistics and census data, measurement of nuptiality, fertility, contraceptive effectiveness and population growth, and on the preparation of population projections.

Prerequisite: Biostatistics 1a,b.

### Demography and Human Ecology 4c,d. Physiology of Human Reproduction

Lectures. *One one-hour session each week, third and fourth periods.* Dr. SALHANICK, Staff of the Center for Population Studies, and Guest Lecturers.

Credit 1 unit.

The course presents the endocrinology of the sex hormones including their secretion, control, biosynthesis, biological effects and modes of action. The principal secretions to be considered are those of the hypothalamus, pituitary, and gonads. In addition, the processes of ovulation, spermatogenesis, fertilization and implantation are covered.

Enrollment is subject to the approval of the Instructor.

### Demography and Human Ecology 5c,d. Readings in Population Studies

Seminars. *One two-hour session each week, third and fourth periods.* Dr. PLANK.

Credit 2 units.

This course is an introduction to the literature pertaining to population theory, research, and fertility control programs. It is offered for students concentrating in the Department. Seminar discussions are directed toward the analysis and evaluation of the assigned selections.

### Demography and Human Ecology 6a,b. Problems of Population (Social Relations 192)

Lectures. *Three one-hour sessions each week, first and second periods.* Dr. HEER.

Credit 3 units.

This course reviews the history of the world's population and the social consequences of different population sizes and growth rates. Special attention is paid to a cross-cultural analysis of the social determinants of fertility, mortality and migration.

A term paper (20-25 pages) is a requirement for this course.

**Demography and Human Ecology 17a,b,c,d. Tutorial Program**

*Time and credit to be arranged.*

Students at the master's level may make arrangements for tutorial work and special reading on topics related to population problems. There may be an opportunity to consider the design of studies, programs or analysis of data.

**Demography and Human Ecology 20. Research**

Doctoral candidates may undertake research in the Department or may integrate research in this field with a doctoral program in another department.

**Demography and Human Ecology 30e. Field Visits**

*January 30 to February 4, 1967.*

Credit 1 unit.

Students majoring in the Department of Demography and Human Ecology participate in visits to organizations currently active in demographic studies, community education, and programs of research and service in fertility control.

**Additional Field Study**

At the end of the academic year, a field visit may be arranged for students majoring in the Department of Demography and Human Ecology.

Limited to ten students.



## ***Interdepartmental Courses***

### **Interdepartmental Course 1.1c. History and Philosophy of Public Health**

Seminars. *One two-hour session each week, third period.* DR. MAYER.

Credit 1 unit.

Required of Master of Public Health candidates.

The course has two major purposes: to help the student of Public Health gain a picture of the development of his profession, and to use selected historical situations to illustrate how scientific knowledge has interacted in the past with political structure, economic status and cultural attitudes in the determination of the health goals of various societies and the execution of programs. In this light, the development of the science and practice of medicine, sanitary engineering and demography in Ancient Egypt, Greece and Alexandria, Rome, the Arab and European Middle Ages and the Renaissance is broadly sketched. The birth of the concept of a National Health Policy is traced to the Ages of Mercantilism and Enlightenment. The Sanitary Movement and its relation to the Industrial Revolution is examined with particular reference to Britain, France and the United States. An attempt is made to evaluate the extent to which the lessons of history have been used in the formulation of health policies in a changing world, both in industrial and in developing nations.

Finally, the broad concept of health utopias, the ideal state of medicine and health as envisaged by various cultures, are examined both in historical and in geographical perspectives.

### **Interdepartmental Course 1.2c,d. Public Health Policies**

Lectures and seminars. *One two-hour session each week, third and fourth periods.* Dean SNYDER and the Faculty of the several Departments.

Credit 2 units.

Required of Master of Public Health candidates.

The course is concerned with contemporary problems of major public health importance. The exercises consider the factors which influence the determination of public policies and priorities. Discussions include pertinent aspects of the planning, organization, administration and evaluation of community-wide programs for prevention or control of the particular health problems. When relevant, the methods used in different regions and by different kinds of organizations are compared.

**Interdepartmental Course 3c,d. Seminar on Teaching of Preventive Medicine and Public Health**

Seminars. *Two two-hour sessions each week, third and fourth periods.*  
Dr. SEGALL and Dr. LEY.

Credit 4 units.

The seminars are designed for students who are preparing for careers as teachers of preventive medicine and public health. Components of the preventive medicine curriculum are considered with respect to course organization and instruction. Current aspects of educational theory relevant to the teaching of medical students are discussed by visiting specialists. Opportunity for field observation of teaching within selected departments of preventive medicine is provided.

Enrollment is limited and is subject to the approval of the Instructor.

**Interdepartmental Course 17c,d. Tutorial Program in Teaching of Preventive Medicine and Public Health**

*Time and credit to be arranged.* Dr. SEGALL or Dr. LEY.

An opportunity for tutorial work in curriculum design, development of methods of instruction and evaluation and other areas related to teaching preventive medicine and public health will be given interested students.

Prerequisite: Enrollment in Interdepartmental Course 3c,d.



# **FOUR**

## **SPECIAL PROGRAMS**





## *Programs in International Health*

The School of Public Health has developed a Division of International Health. The primary objective of this Division is to utilize all departments and facilities of the School, as well as other related divisions of the University, to provide a comprehensive, effective, and efficient program of teaching, research, and service in all fields of international health.

The programs centered in the School, together with related course offerings in other divisions of Harvard University and the Massachusetts Institute of Technology, offer the student a broad background in preparation for future careers in the World Health Organization, the Agency for International Development of the U.S. State Department, the U.S. Public Health Service, the Peace Corps, the Armed Forces, industrial organizations, mission groups, philanthropic foundations, or with other governments and agencies providing varied careers in international health and in planning health services for developing countries.

The relevant course offerings are not concentrated in any one department of the School, since all departments have broad international interests in their respective fields. In addition to the requirements for the Master of Public Health degree, a varied selection of elective courses is available in the various Departments of the School in preparation for careers in international health.

Other divisions of Harvard University, namely the:

Faculty of Arts and Sciences,  
Graduate School of Public Administration,  
Center for Middle Eastern Studies,  
East Asian Research Center and  
Development Advisory Service of the  
Center for International Affairs

provide additional opportunities for study in economics, public administration, anthropology, government, social relations, language,

and related subjects for students with special interests in particular regions of the world. Cross-registration opportunities for students interested in similar course offerings given by the Massachusetts Institute of Technology are also available. The various catalogues of these Faculties may be consulted for further details.

Programs of study may be selected leading to the Master of Public Health or Master of Science in Hygiene. Advanced students may be accepted as candidates for the Doctor of Public Health or Doctor of Science in Hygiene degrees. Tentative approval has already been received for a three-year residency program for physicians preparing for certification by the American Board of Preventive Medicine in the area of General Preventive Medicine (International Health).

Areas in which supervised field work or research may be undertaken will vary, depending on current opportunities afforded and the availability of qualified supervision. For example, under the sponsorship of the Department of Tropical Public Health, trainees have been engaged in studies on schistosomiasis in Nigeria and Brazil, on malaria in Gambia, and on nutritional anemias in Uganda. The Department of Nutrition has sponsored trainees in nutritional studies in Colombia. Other relationships have been or are in the process of being established with the Hôpital Albert Schweitzer in Haiti, Ministry of Health in the Bahamas, Puerto Rico, Jamaica, Brazil, Tunisia, Italy, Israel, Lebanon, Saudi Arabia, Nigeria, and in other developing areas of the world. Assignments to international agencies for work experience or research activities abroad are made only when the School is assured that competent local supervision and guidance are available.

Examples of current international research being conducted by the School include trachoma research in Saudi Arabia and Lebanon; interrelationships of health and economic development in Tunisia; child growth and development in Italy; comparative heart disease studies in Ireland and U.S.; nutrition research in Colombia and Israel; population studies in Chile, Greece, United Arab Republic and India; research on Chagas' disease in Brazil; typhus in Yugoslavia; research on urinary calculi in Thailand; cooperative

cardiovascular disease investigation in Japan; relative importance of hereditary environmental factors in cardiovascular disease in Israel; and collaborative studies on cervical cancer, breast cancer and leukemia involving numerous countries and comparisons of prevalence of chronic respiratory disease between the United States and the United Kingdom, and the United States and Japan.



Trachoma program in Saudi Arabia

The School has sponsored triennial meetings of the *Industrial Council for Tropical Health* since 1950. These conferences bring together guest experts, members of the Faculty, and medical and managerial personnel of corporations having interests in tropical re-



## HARVARD UNIVERSITY

gions for scientific and practical discussions of health problems. Through these conferences the School has established a wealth of international contacts which are of mutual benefit to industry, the School, its students, and alumni throughout the world.

International House, the School's residence for its graduate students and their families, both from the United States and abroad, provides an unusual opportunity for international contacts and extracurricular activities with professional health workers from a variety of countries. Some twenty-two to twenty-eight nations are represented in this group each year. Throughout the year there are opportunities for informal interchanges of ideas between students and their families. In addition, there are frequent discussions on topics of international interest, including presentations by international students on the culture, geography, social structure, and health problems of their home countries.

Finally, the Boston area as a whole provides a stimulating atmosphere for students interested in international affairs through such agencies as the local chapter of the Society for International Development, World Affairs Council, Pan American Society of New England, and many other agencies, programs and activities.

More current details on residency opportunities or other aspects of these programs may be obtained by addressing inquiries to Dr.

An International House tea



Richard H. Daggy, Associate Dean for International Programs at the School.

Participating Departments of the School and their representatives in the Division of International Health are listed below:

RICHARD H. DAGGY, S.B., S.M., PH.D. M.P.H., DR.P.H., Associate Dean of the Faculty of Public Health for International Programs, and Lecturer on Tropical Public Health.

*Behavioral Sciences*

JANE M. MURPHY, A.B., PH.D., Assistant Professor of Anthropology.

*Biostatistics*

JANE WORCESTER, A.B., DR.P.H., Professor of Biostatistics and Epidemiology.

*Demography and Human Ecology*

STEPHEN J PLANK, PH.B., A.B., M.D., M.P.H., DR.P.H., Assistant Professor of Population Studies.

*Epidemiology*

ASCHER J. SEGALL, M.D., M.P.H., DR.P.H., Assistant Professor of Epidemiology.

*Health Services Administration*

ALONZO S. YERBY, S.B., M.D., M.P.H., Professor of Health Services Administration. Diplomate, American Board of Preventive Medicine (Public Health).

*Maternal and Child Health*

ISABELLE VALADIAN, M.D., M.P.H., Associate Professor of Maternal and Child Health. Diplomate, American Board of Preventive Medicine (Public Health).

*Microbiology*

EDWARD S. MURRAY, A.B., M.D., M.P.H., Associate Professor of Microbiology. Diplomate, American Board of Internal Medicine.

*Nutrition*

JEAN MAYER, B.A., B.SC., M.SC., PH.D., D.SC., A.M. (hon.), Professor of Nutrition and Lecturer on the History of Public Health.

*Physiology*

HARBEN J. BOUTOURLINE-YOUNG, M.B.,B.S., D.C.H., M.D., Research Associate in Physiology. Diplomate, American Board of Pediatrics, M.R.C.P. (London).

**HARVARD UNIVERSITY**

*Sanitary Engineering*

ROBERT P. BURDEN, S.B., S.M., S.D., Assistant to the Dean *and* Administrative Associate, Water Quality Program, Division of Engineering and Applied Physics.

*Tropical Public Health*

THOMAS E. FROTHINGHAM, M.D., Associate Professor of Tropical Public Health. Diplomate, American Board of Pediatrics.

## *Harvard University Interfaculty Program on Health and Medical Care*

The Interfaculty Program on Health and Medical Care is a co-operative undertaking of the Schools of Public Health, Medicine, Public Administration, Business Administration, and the Department of Economics in the Faculty of Arts and Sciences. Its major purpose is to provide advanced programs in the economics and administration of medical care at both the master's degree and doctoral levels for personnel in the various relevant disciplines.

The Program is intended to equip the student for administrative and policy-making posts in medical care programs or for related teaching and research positions. The Program is planned for several types of students: (1) for those whose needs are met by a master's degree program at the School of Public Health or School of Public Administration, (2) for students who wish to specialize more intensively in medical care during a two-year period, (3) for doctoral candidates under the guidance of any of the participating faculties, and (4) for physicians participating in the residency program in General Preventive Medicine (Health Services Administration) in the School of Public Health.

The Program offers training and research experience in the provision of medical care services and stresses the study and analysis of varying patterns of personal health services in the United States and other countries. Students include physicians and other health professionals, economists, social scientists, and management analysts. They are from the various participating schools and departments within Harvard University, and are enrolled as master or doctoral degree candidates in their own schools and departments while taking the Program's basic courses.

A wide range of elective courses is available, in addition to those offered by the School of Public Health, through the various faculties concerned and from the Massachusetts Institute of Technology.



The objective with students enrolled in the School of Public Health is to instruct them in analysis and decision-making and to give them an appreciation of the application of the administrative and social sciences in the operation of medical care programs. For students from other than the School of Public Health, the Program's objective is to provide an adequate understanding of medical care services and to allow for the intelligent application of their own specialities to the medical care scene.

The Program's research activities provide opportunities for exceptional students to undertake doctoral work and to gain substantial research experience.

For more detailed information on various aspects of the Program, including support for physician residency training, address inquiries to Dr. Alonzo S. Yerby, Professor of Health Services Administration and Director of the Interfaculty Program on Health and Medical Care.

## *Postdoctoral Fellowship Program in Dental Public Health*

The School of Dental Medicine in cooperation with the School of Public Health and the Massachusetts Department of Public Health offers a two or three-year program of postdoctoral study intended to prepare a limited number of individuals for creative full-time careers in dental public health and ecological dentistry. Each person accepted into the program will be appointed as a Research Fellow in Ecological Dentistry at the School of Dental Medicine.

**Two-Year Program:** The first year is spent at the School of Public Health as a candidate for the degree of Master of Public Health. Elective studies may be taken at the School of Dental Medicine in the Spring Term. The second year involves residency training in cooperation with the Massachusetts Department of Public Health to meet the requirements of the American Board of Dental Public Health.

**Three-Year Program:** The first two years are similar to the Two-Year Program but include advanced didactic work and research training at the School of Dental Medicine. Residency requirements are completed during the second and third years. In addition, the third year involves research, the preparation of a research thesis, and teaching experience. A Three-Year Postdoctoral Fellowship Certificate is awarded upon completion.

The program is designed to meet the needs of the particular student. Academic study beyond the master's level may be arranged in other departments of the University. Residency training involves responsible work with the Massachusetts Department of Public Health at the state or community level. Epidemiological or other research work can be carried on over the entire three-year period in a variety of situations involving either new or continuing studies.

**HARVARD UNIVERSITY**

For further information and application forms, write to James M. Dunning, D.D.S., M.P.H., Clinical Professor of Ecological Dentistry, Harvard School of Dental Medicine, 188 Longwood Avenue, Boston, Massachusetts, 02115.

# **FIVE**

## **GENERAL INFORMATION**





## *Registration*

Registration in the School of Public Health for the academic year 1966-67 is held on the following dates:

- |                                 |   |
|---------------------------------|---|
| September 12, Monday, 10 a.m.   | Opening session and registration for new International Students   |
| September 14, Wednesday, 2 p.m. | Opening session and registration for new U.S. Students            |
| September 19, Monday, 10 a.m.   | Opening session and registration for students enrolled in 1965-66 |

The period between the opening sessions and September 23 is devoted to conferences with Faculty members, selection of courses of study and orientation lectures. Formal instruction begins on Monday, September 26. All students are required to attend the opening session and to be present for the registration period.

## *International Students*

Students coming to the United States for the first time participate in a program of lectures and discussions during the period from Monday, September 12 to Friday, September 23, 1966. The program is planned to acquaint the students with our customs and teaching methods, with library and other facilities available. It includes lectures and seminars, visits to various University departments and to hospitals or public health activities in Boston.

During this period each student who comes from outside the United States will have a conference with the Associate Dean for International Affairs to discuss his particular needs and interests. The Associate Dean, as well as the staff of the Dean's Office, is available for consultation with students throughout the year.

All students who are not citizens of the United States are referred during the orientation period to the Harvard International Office, Holyoke Center, 75 Mt. Auburn Street, Cambridge, where they show their passports, and fill out a Student Registration form.

*Fees and Expenses*

The tuition fee for the academic year 1966-67 is \$1,850 for all full-time students in the first year of a program and for full-time Master's candidates enrolled for a second year. The fee includes the Health Service Fee for medical care and insurance for all resident students. Each candidate for a degree must have a minimum of one year of residence at the School at full tuition. Doctoral candidates who are enrolled for more than one year and students who are enrolled for less than full time pay tuition at reduced rates, as shown in the schedule below. For the academic year 1967-68, the tuition will be \$2,000.

<i>First Year</i>	<i>Rate</i>
Full-time resident students .....	\$1,850
Half-time resident students .....	1,000

<i>Second Year</i>	
Full-time resident students in the second year of a two-year Master's program .....	\$1,850
Full-time resident students in the second year who are in a new Master's program .....	1,850
Full-time resident doctoral candidates .....	1,000
Half-time resident doctoral candidates .....	575
Non-resident doctoral candidates, guidance fee .....	300
Other half-time resident students .....	1,000

<i>After the second year</i>	
Full-time resident doctoral candidates .....	\$1,000
Half-time resident doctoral candidates .....	575

# SCHOOL OF PUBLIC HEALTH

Non-resident doctoral candidates, guidance fee .....	\$300
Other half-time resident students .....	1,000

*Part-time Special Students*, enrolled for less than half-time:  
 \$90. for first credit unit of course work plus \$42.50 for each additional unit per term up to 10 units

## Summer Session

Students who register for research or supervised study during part or all of the 12-week summer period will pay tuition as follows:

Students who have not completed the residence requirement for a degree; full-time 12 weeks .....	\$694
(Based on $\frac{3}{4}$ of full-time tuition for 1 term)	
Students who have completed the residence requirement for a degree; full-time 12 weeks .....	347
(Based on $\frac{1}{2}$ of above amount)	

Students registered for less than 12 weeks or for less than full time will pay at a proportionate rate

## Payment of Fees

Bills for tuition and fees will be issued and payable as follows:

<i>Issued</i>	<i>Payable</i>	
At registration	Within 10 days	$\frac{1}{4}$ Tuition
Nov. 30	Dec. 15	$\left\{ \begin{array}{l} \frac{1}{4} \text{ Tuition} \\ \text{Board through October 31} \\ \text{Miscellaneous Charges} \end{array} \right.$
Jan. 30	Feb. 15	$\left\{ \begin{array}{l} \frac{1}{4} \text{ Tuition} \\ \text{Board through December 31} \\ \text{Miscellaneous Charges} \end{array} \right.$
April 30	May 15	$\left\{ \begin{array}{l} \frac{1}{4} \text{ Tuition} \\ \text{Board through March 31} \\ \text{Miscellaneous Charges} \end{array} \right.$



## HARVARD UNIVERSITY

June 7*	June 14	{ Board to the end of the year Miscellaneous Charges
June 30	July 15	{ Board to the end of the year Miscellaneous Charges

Students who are candidates for degrees must have paid all dues to the University at least one day before the day upon which the degrees are to be voted. A student who leaves during the year is charged to the end of the tuition period in which he leaves, provided before that time he gives the Dean notice in writing of his withdrawal; otherwise he is charged to the end of the tuition period in which such notice is given.

A student who leaves the University for any reason whatever must pay all charges against him immediately upon receipt of a bill from the Comptroller's Office. Every student is held responsible for the payment of fees until he has notified the Dean of his intention to withdraw from the School.

All term bills are sent to the student at his local address unless the Comptroller's Office is requested in writing to send them elsewhere.

Any student whose indebtedness to the University remains unpaid on the date fixed for payment is deprived of the privileges of the University. Reinstatement is obtained only by consent of the Dean of the School in which the student is enrolled after payment of all indebtedness and a reinstatement fee of \$10. In addition as a condition of reinstatement such student is required to file with the Comptroller a bond in the amount of \$1000 as security for the payment of future term bills.

### Field Observation Study Visit

The estimated cost of travel, hotel accommodations, and food for the one-week study period in Puerto Rico (Maternal and Child Health 30e) is \$300. Each student wishing to enroll in the course should assure himself that the necessary funds to cover this expense are available from his fellowship or other sources.

\* Applies only to candidates for degrees.

## *Student Health Service*

Under the University Health and Insurance Plan, students at the School of Public Health receive medical care and insurance toward hospital expenses. Medical care is provided through the facilities of the Medical Area Health Service, located in Vanderbilt Hall. The hospitalization insurance extends for a period of twelve months from September 1, and covers hospitalization in Boston and elsewhere. Research Fellows who are in a training status may enroll in the Student Plan.

Dependents of students may be included in the hospital insurance part of the plan, if the student so elects. The rates are \$53.00 for wives or husbands, and \$52.00 for one or more children, for twelve months from September 1. This insurance, like that of the Student Plan, includes full semi-private coverage. Students are advised to avail themselves of this option. Student dependents are not eligible for medical care in the Health Services of the University.

Entrance medical examinations are required of all entering full-time students except for United States Government employees and United States military personnel.

Evidence of successful vaccination against smallpox within three year is required for entrance to Harvard University, and a certification form for this purpose is sent to each student who is accepted for admission.

Any illness necessitating absence from classes should be reported to the Student Health Service Office by the student or an attending physician, and to the Registrar's Office at the School. A physician from the Health Service is on call twenty-four hours a day and can be reached through the switchboard of the Medical School.

In order to realize maximum benefit from the opportunities provided by the academic program of the School, students must be in excellent physical and mental health. Prospective students are urged to undergo a thorough examination to satisfy themselves of their fitness before making arrangements to enter the School.



Residents enjoy a wide selection for browsing, reading and borrowing in the International House library.

The children have their own room indoors and a safe park-playground outside.





## *Housing*

The Henry Lee Shattuck International House is the apartment residence maintained by the Harvard School of Public Health for its full-time students and their families. These apartments are comfortably furnished and are leased for the ten month period, September through June. Detailed information and the necessary forms are issued at the time of admission to the School.

Interested students are advised to forward their applications to Mrs. Margaret D. Penrose, Harvard School of Public Health, 55 Shattuck Street, Boston, Mass. 02115. Applications are reviewed during June and all applicants are notified by June 30th.

The children entertain at a Christmas party.





Housing in Boston is expensive and adequately furnished apartments are limited. Additional information on housing in the vicinity of the School and nearby residential areas may be obtained from the Harvard University Housing Office, 1737 Cambridge Street, Cambridge, Mass. 02138, and also from the Registrar of the Harvard School of Public Health at 55 Shattuck Street. Students writing for information should indicate the size of their family, the number of rooms desired and whether or not they wish furnished or unfurnished accommodations.

## *Employment*

Generally it is not advisable for a student to seek employment as a means of financing his training because the course of study at the School is an intensive, full-time program. If the wife of a student has secretarial or technical skills and wishes to obtain temporary employment, she may consult the Harvard Medical Center Personnel Office in Building A of the Medical School after getting settled in Boston. Wives of foreign students who wish to work in Boston must indicate this fact when obtaining their visas for the United States.

## *Fellowships and Traineeships*

The fellowships and traineeships described below were available to students for the academic year 1965-66. It is expected that comparable awards will be available for 1967-68.

Applications for fellowships and traineeships should be made to: The Registrar, Harvard School of Public Health, 55 Shattuck Street, Boston, Massachusetts 02115. Applications should be received by April 1, 1967 for awards for the academic year 1967-68. Under exceptional circumstances awards may be considered at other times.

### **Fellowships and Traineeships Awarded by the School**

Fellowships and traineeships are available from grants to the School for students who are candidates for master's or doctor's degrees. They include a monthly stipend plus tuition. Applicants for awards from Public Health Service or Children's Bureau grants must be citizens of the United States or have been lawfully admitted to the United States for permanent residence.

1. Public Health Service General Purpose Traineeship Grant (Title I) for physicians, dentists, veterinarians, nutritionists, medical social workers, health educators and others whose professional skills are required in modern public health practice.

2. Public Health Service Title II traineeships for public health nurses.

3. Traineeships from Public Health Service Training Grants to Departments of the School are available for study at the pre-doctoral or post-doctoral levels in the following fields:

Biostatistics.

Environmental Health (including occupational medicine, radiological health and air pollution).

Industrial Hygiene.

Physiology (including toxicology).

Epidemiology; for candidates with degree of M.D. or Ph.D. or equivalent.

Microbiology; for candidates with degree of M.D. or Ph.D. who wish to specialize in the field of infectious diseases, including rickettsial, viral, bacterial and mycological infections.

Nutrition.

Public Health Service Special Purpose Traineeship Grant for training in the economics and administration of medical care at the master's level. Traineeships from Public Health Service Training Grant for research training in medical care at the doctoral level.

Tropical Public Health; for training in medical parasitology, in tropical medicine and in tropical public health.

4. Fellowships provided by a grant from the Children's Bureau are available for students who intend to specialize in Maternal and Child Health.

## **HARVARD UNIVERSITY**

5. Fellowships provided by a training grant from the National Aeronautics and Space Administration are available for students who intend to specialize in aerospace health and safety.

### **Fellowships Awarded Outside the School**

Fellowships are available in Industrial Medicine and Health Physics from the Atomic Energy Commission. Applicants for fellowships in Industrial Medicine (physicians only) should write to: A.E.C. Fellowships in Industrial Medicine, Atomic Energy Project, University of Rochester, School of Medicine and Dentistry, Rochester 20, New York. Applicants for fellowships in Health Physics should write to: Fellowship Office, Oak Ridge Institute of Nuclear Studies, Oak Ridge, Tennessee.

### **Fellowships and Scholarships Available in Other Departments of the University as well as in the School of Public Health**

There are a few General University Scholarships and Fellowships which, under the terms of the original gift to the University, may be awarded to students in any part of the University, including the School of Public Health. Many of these are for persons from a particular city, state or country, for study of a particular field, or for those with other special qualifications. Applications for these scholarships must be received at the School of Public Health by February 1, 1967. A pamphlet describing these University Scholarships may be obtained from the Secretary of Admissions and Scholarships of the School of Public Health.

## *Students 1965-66*

### **Degree Candidates and Full-Time Special Students**

Godfrey D. Adamson, S.B., M.D.	San Francisco, California
Darrell E. Anderson, B.Ch.E.	Minneapolis, Minnesota
Frederic Bass, S.B., M.D.	Avenel, New Jersey
Gretchen M. Berggren, A.B., M.D.	Aurora, Nebraska
Warren L. Berggren, M.D., M.P.H.	Aurora, Nebraska
Joseph D. Brain, A.B., S.M., S.M. IN HYG.	Cambridge, Massachusetts
Andrew G. Braun, A.B., S.B., S.M. IN HYG.	Brookline, Massachusetts
Adolph J. Brink, A.B., M.D., M.P.H.	Elma, New York
Richard C. Brown, A.B., M.D.	Norfolk, Virginia
Max J. Bulian, S.B., M.D.	Chestnut Hill, Massachusetts
Charles R. Buncher, S.B., S.M. IN HYG.	Millburn, New Jersey
Edward J. Burger, Jr., B.Sc., M.D.C.M., M.I.H.	Dover, Massachusetts
Thomas R. Byrd, S.B., M.D., M.P.H.	Kershaw, South Carolina
Myrtle U. Caton, A.B., M.D.	Boston, Massachusetts
Paul C. Y. Chen, M.B., B.S., M.P.H.	Kuala Lumpur, Malaysia
Siew T. Chen, M.B., B.S., M.P.H.	Kuala Lumpur, Malaysia
Yuan P. Chen, M.D.	Taipei, Taiwan
Alfred K. Cheng, S.B., M.D.	Topeka, Texas
Harvey S. Collins, S.B., A.M., M.D.	New York, New York
Roger R. Connelly, S.B., S.M. IN HYG.	Mason City, Iowa
George P. Contis, A.B., M.D.	Pittsburgh, Pennsylvania
Donald A. Creasia, A.B.	Brighton, Massachusetts
Allen L. Cudworth, S.B., S.M.	Framingham, Massachusetts
Babalola A. Dada, M.D.	Lagos, Nigeria
Fritz Daguillard, M.D., M.P.H.	Cayes, Haiti
John W. Davies, M.B.B.S., D.P.H.	Ottawa, Canada
Michael A. Davis, S.B., S.M., S.M. IN HYG.	Quincy, Massachusetts
John R. Davy, A.B., M.D.	Spring Field, Pennsylvania
Stanley V. Dawson, S.B., S.M.	Cambridge, Massachusetts
Selma R. Deitch, S.B., M.D.	Manchester, New Hampshire
Shashi D. Desai, M.B., B.S.	Bombay, India
John D. Dougherty, A.B., M.D., M.P.H.	Fort Worth, Texas
Thomas S. Durant, S.B., M.D.	Dorchester, Massachusetts
Johanna T. Dwyer, S.B., S.M., S.M. IN HYG.	Syracuse, New York
Halmond C. Dyer, M.B., B.S.	Kingston, Jamaica
Jacqueline H. Fabia, M.D.	Paris, France



## HARVARD UNIVERSITY

- John H. Fahrni, S.B., M.D.  
Manning Feinleib, A.B., M.D., M.P.H.  
Jean-Marc Fredette, M.D., PH.D.  
Dorothy J. Ganick, A.B.  
Stephen J. Garza, D.D.S.  
Hossein Ghassemi, DR. OF PHARMACY, S.M.  
Robert F. Gloor, A.B., M.D.  
Judith D. Goldberg, A.B.  
Donald E. Goldstone, A.B., M.D.  
Marise S. Gottlieb, A.B., M.D.  
Ronald S. Green, M.D.  
Rodrigo Guerrero, M.D.  
Vincent F. Guinee, S.B., M.D.  
Virginia Guzman, M.D.  
Virginia R. Hannon, A.B., A.M., M.S.W., S.M.  
IN HYG. (in absentia)  
Alan C. Harter, A.B., M.D.  
Elmer R. Hermann, Jr., S.B., M.D.  
Marion E. Highriter, A.B., M.N., M.P.H.  
Tomio Hirohata, M.D., S.M. IN HYG.  
Alice M. Hosack, S.B., A.M., S.M. IN HYG.  
Clarence A. Jernigan, A.B., M.D.  
William R. Jobin, S.B., S.M., S.M. IN HYG.  
Leonard W. Johnson, Jr., S.B., M.D.  
Anthony Jong, S.B., D.D.S.  
Edward N. Kassira, M.B., CH.B., M.P.H.  
Won C. Kay, M.D., DR.MED.SC.  
A. Kay Keiser, S.B., M.P.H.  
Irving I. Kessler, A.B., A.M., M.D., M.P.H.  
(in absentia)  
Leon E. Kruger, S.B., M.D.  
Claude A. Lanctot, M.D.C.M.  
Robert R. Lauwerys, M.D., M.I.H.  
Robert K. Leet, A.B., M.D.  
Gary S. Leske, D.D.S.  
Yuling Li, A.B.  
David J. Lieberman, M.D.  
Lionel M. Lieberman, A.B., M.D., M.I.H.  
Eric E. Lindstrom, S.B., M.D.  
Robert D. Lynch, A.B.  
Judith A. Mabel, S.B.  
William J. MacPherson, B.Sc., M.D., C.M.  
Seneca, South Dakota  
Newton, Massachusetts  
Quebec City, Canada  
Brookline, Massachusetts  
McAllen, Texas  
Teheran, Iran  
South Lancaster, Massachusetts  
New York, New York  
Baltimore, Maryland  
Bethesda, Maryland  
Chicago, Illinois  
Cali, Colombia  
New York, New York  
Manila, Philippines  
Atlanta, Georgia  
Stockbridge, Massachusetts  
Milwaukee, Wisconsin  
Wilkes-Barre, Pennsylvania  
Fukuoka City, Japan  
Boston, Massachusetts  
Houston, Texas  
Foxboro, Massachusetts  
Elkhart, Indiana  
New York, New York  
Baghdad, Iraq  
Seoul, Korea  
Kulpmont, Pennsylvania  
Brooklyn, New York  
Newton Center, Massachusetts  
Montreal, Canada  
Bertem Brabant, Belgium  
Worcester, Massachusetts  
New Rockford, North Dakota  
Brookline, Massachusetts  
Feasterville, Pennsylvania  
Hampton, Virginia  
Helena, Montana  
Dorchester, Massachusetts  
Albany, New York  
Campbellton, New Brunswick,  
Canada

## SCHOOL OF PUBLIC HEALTH

James O. Mason, A.B., M.D., M.P.H. (in absentia)	Decatur, Georgia
Louis M. F. Masse, M.D., M.P.H. (in absentia)	Reims, France
Fergus S. McCullough, B.Sc., M.Sc., Ph.D.	Belfast, North Ireland
Arthur H. McIntosh, B.A., M.S.A., S.M.	Jamaica Plain, Massachusetts
Phyllis B. Michelson, A.B., S.M.	New Bedford, Massachusetts
Ralph E. Miller, A.B., M.D.	Hanover, New Hampshire
William M. Moore, A.B., M.D.	Darien, Connecticut
Margot L. Morris, A.B.	Oshawa, Ontario, Canada
Debhanom Muangman, A.B., M.D., M.P.H.	Bangkok, Thailand
Gretel S. Munroe, A.B., A.M.	New York, New York
Raymond L. H. Murphy, Jr., S.B., M.D., M.P.H.	Flushing, New York
Lechaim Naggan, M.D.	Herzlia, Israel
Charles Neave, A.B., M.D., M.P.H.	New Canaan, Connecticut
Raymond K. Neff, A.B.	New Rochelle, New York
Shirley A. Nelson, A.B., M.S.W.	Fort Collins, Colorado
David M. Nitzberg, A.B., M.Sc., S.M. IN HYG.	Lexington, Massachusetts
Niles L. Perkins, A.B., M.D.	Portland, Maine
John M. Peters, S.B., M.D., M.P.H.	Salt Lake City, Utah
Ann H. Pettigrew, A.B., M.D.	Cambridge, Massachusetts
Celso M. Pugliese, M.D.	Salvador, Bahia, Brazil
William P. Reagan, A.B., M.D.	Little Rock, Arkansas
Parker C. Reist, S.B., S.M., S.M. IN HYG.	State College, Pennsylvania
Elihu D. Richter, A.B., M.D.	New York, New York
Thora J. Runyan, S.B.	Boston, Massachusetts
William S. Runyan, S.B., S.M.	Boston, Massachusetts
Larry D. Samuels, A.B., S.B., M.D., S.M. IN HYG. (in absentia)	New Windsor, Illinois
Vitura Sangsinkeo, M.D.	Bangkok, Thailand
Richard H. Seder, A.B., M.D.	Worcester, Massachusetts
Anne Sharratt, M.B., B.Ch., B.A.O.	Drogheda, Ireland
Reinhard Sidor, A.B.	Ayer, Massachusetts
Alvin J. Simmons, Ph.D., S.M. IN HYG. (in absentia)	South Dartmouth, Massachusetts
Jeannette J. Simmons, S.B., M.P.H.	Studio City, California
Lee G. Slocum, A.B.	Pittsburgh, Pennsylvania
Daniel H. Spoor, A.B., M.D.	Houston, Texas
Judith S. Stern, S.B.	Bethesda, Maryland
Doris H. Thompson, S.B., M.D.	Lake Charles, Louisiana
Guthrie L. Turner, Jr., S.B., M.D.	Snow Hill, North Carolina
Dwight W. Underhill, B.E., S.M. IN HYG.	Washington, D. C.

**HARVARD UNIVERSITY**

Cristina Vera, S.B., M.D.	Santiago, Chile
Anton F. Vierling, S.B., S.M., S.M. IN HYG. (in absentia)	Cincinnati, Ohio
Melva V. Vives, B.S.CH.E.	Quezon City, Philippines
Joseph K. Wagoner, S.B., S.M.	Rochester, Minnesota
James E. C. Walker, A.B., M.D.	Boston, Massachusetts
James H. Warram, S.B., M.D.	Oklahoma City, Oklahoma
Elizabeth L. Watkins, A.B., M.S.S.A., S.M. IN HYG.	Chevy Chase, Maryland
Charles W. Wight, B.S.CH.E.	Corpus Christi, Texas
Charles T. Wilson, A.B., M.S.W.	Roberta, Georgia
Dorothy Wilson, M.D.	Panama, Republic of Panama
John J. Witte, A.B., M.D.	Atlanta, Georgia
Dorothy J. Worth, M.D.	Newton, Massachusetts
Stella B. Yen	Wellesley, Massachusetts
John D. Yoder, S.B., S.M. IN HYG. (in absentia)	St. Louis, Missouri
Samuel A. Youngman, S.B., M.D.	Scituate, Massachusetts

**Part-Time Special Students**

Nancy B. Colson, S.B.	Weston, Massachusetts
Janice M. Dodds, S.B., M.ED.	Springfield, Illinois
Daniel A. Garcia, D.D.S.	Brookline, Massachusetts
Albert J. Kazis, D.M.D.	Newton, Massachusetts
Philip LaTorre, S.B., S.M.	Wakefield, Massachusetts
Harry Olkeu, A.B., M.D.	Swampscott, Massachusetts
Gerald S. Parker, S.B., S.M., S.M. IN HYG.	Brookline, Massachusetts
Edith H. Reinisch, S.M.	Holyoke, Massachusetts
Roy M. Shulman, A.B., M.D.	Cambridge, Massachusetts
Hope H. Snider, A.B., M.D., M.P.H.	Cambridge, Massachusetts

**SUMMARY**

Candidates for the degree of Master of Public Health .....	50
Candidates for the degree of Master of Science in Hygiene .....	37
Candidates for the degree of Doctor of Public Health .....	8
Candidates for the degree of Doctor of Science in Hygiene .....	31
Full-time Special Students .....	2
Part-time Special Students .....	11

**GEOGRAPHICAL ORIGINS OF STUDENTS**

United States .....	108
Canada .....	5
Central and South America .....	5
Europe .....	6
Africa .....	1
Middle East .....	3
Far East .....	11
	<hr/>
	139



# Degrees

On June 17, 1965, the following degrees were conferred:

## DOCTOR OF SCIENCE IN HYGIENE

- Helen Zarsky Reinherz, A.B. (*Wheaton Coll.*) 1944, S.M. (*Simmons Coll.*) 1946, S.M. HYG. (*Harvard Univ.*) 1962.  
Thesis: A Follow-up Study of Student Volunteers in a Mental Hospital  
Special Field: Public Health Practice (Community Mental Health)

## MASTER OF PUBLIC HEALTH

- George Adeyemi Ademola, M.B.,B.S. (*Univ. of Durham, England*) 1951, DPH (*Univ. of London, England*) 1953.  
Abdul Rahman Abdulla Al-Awadi, B.Sc. (*American Univ., Lebanon*) 1958, M.B.,CH.B. (*Univ. of Aberdeen, Scotland*) 1963.  
Joan Morrissey Altekruise, A.B. (*Vassar Coll.*) 1949, M.D. (*Stanford Univ.*) 1960.  
Charles Chukwuemeka Azu, S.B. (*Washburn Univ.*) 1955, M.D. (*Saint Louis Univ.*) 1959.  
Adolph Joseph Brink, A.B. (*Univ. of Buffalo*) 1958, M.D. (*ibid.*) 1962.  
Gro Harlem Brundtland, M.D. (*Univ. of Oslo, Norway*) 1963.  
John Nelson Chappel, A.B. (*Univ. of Alberta, Canada*) 1955, M.D. (*ibid.*) 1960.  
Paul Chieh Yee Chen, M.B.,B.S. (*Univ. of Malaya, Malaysia*) 1960.  
Joseph Anthony Cimino, A.B. (*Harvard Univ.*) 1956, S.M. (*Fordham Univ.*) 1958, M.D. (*Univ. of Buffalo*) 1962, M.I.H. (*Harvard Univ.*) 1964.  
Edward Fowler Cole, S.B. (*Univ. of Florida*) 1953, M.D. (*Vanderbilt Univ.*) 1960.  
Constance Campbell Conrad, A.B. (*George Washington Univ.*) 1958, M.D. (*ibid.*) 1961.  
Justin Lyle Conrad, A.B. (*Northwestern Univ.*) 1957, M.D. (*George Washington Univ.*) 1961.  
Catherine Coolidge, A.B. (*Radcliffe Coll.*) 1953, M.D. (*Johns Hopkins Univ.*) 1958.  
Fritz Daguiard, M.D. (*Univ. of Haiti, Haiti*) 1961.  
Chesley Reuben Davies, S.B. (*Univ. of Utah*) 1960, M.D. (*ibid.*) 1963.  
Audie White Davis, S.B. (*Univ. of Alabama*) 1953, M.D. (*ibid.*) 1957.  
Heather Murison Day, M.B.,CH.B. (*Univ. of Edinburgh, Scotland*) 1957.  
John Dennis Dougherty, A.B. (*Univ. of Kansas*) 1955, M.D. (*ibid.*) 1958.

## SCHOOL OF PUBLIC HEALTH

- James Elmer Drolte, s.B. (*Kansas State Univ.*) 1955, s.B. (*ibid.*) 1959, D.V.M. (*ibid.*) 1961.
- William Herbert Foege, A.B. (*Pacific Lutheran Univ.*) 1957, M.D. (*Univ. of Washington*) 1961.
- Paul Richard Foote, A.B. (*Cornell Univ.*) 1943, M.D. (*ibid.*) 1945.
- Donald Tell Fredrickson, A.B. (*Syracuse Univ.*) 1956, M.D. (*Cornell Univ.*) 1961.
- Christian Max Hansen, A.B. (*Haverford Coll.*) 1954, M.D. (*Univ. of Pennsylvania*) 1958.
- Norman Blaine Hasler, A.B. (*Indiana Univ.*) 1942, M.D. (*ibid.*) 1944.
- Arthur Ray Jacobs, A.B. (*Wesleyan Univ.*) 1957, M.D. (*Univ. of Rochester*) 1961.
- Wayne Alden Johnson, s.B. (*Wake Forest Coll.*) 1960, M.D. (*ibid.*) 1963.
- Charles Patrick Kirkland, s.B. (*Univ. of Oklahoma*) 1959, M.D. (*ibid.*) 1963.
- Michael Charles Latham, A.B. (*Univ. of Dublin, Ireland*) 1949, M.B., B.CH., B.A.O. (*ibid.*) 1952, D.T.M. & H. (*Univ. of London, England*) 1958.
- Alan Ira Levenson, A.B. (*Harvard Univ.*) 1957, M.D. (*ibid.*) 1961.
- Richard Harold Morrow, A.B. (*Swarthmore Coll.*) 1954, M.D. (*Washington Univ., St. Louis*) 1958.
- Royce Moser, A.B. (*Harvard Univ.*) 1957, M.D. (*ibid.*) 1961.
- Debhanom Muangman, A.B. (*Grinnell Coll.*) 1958, M.D. (*Jefferson Medical Coll.*) 1962.
- Raymond Leo H. Murphy, s.B. (*Holy Cross Coll.*) 1954, M.D. (*New York Univ.*) 1961.
- Charles Gordon Rand, A.B. (*Mount Allison Univ., Canada*) 1938, M.D.C.M. (*McGill Univ., Canada*) 1942.
- Harvey Ira Remmer, A.B. (*Clark Univ.*) 1958, M.D. (*Tufts Univ.*) 1962.
- Alvan Gerald Renthall, A.B. (*Yale Univ.*) 1951, M.D. (*Columbia Univ.*) 1955.
- David Willard Rodgin, A.B. (*Yale Univ.*) 1949, A.M. (*George Washington Univ.*) 1952, PH.D. (*Purdue Univ.*) 1955, M.D. (*Univ. of Cincinnati*) 1961.
- Leonard Arthur Sagan, A.B. (*Stanford Univ.*) 1950, M.D. (*Univ. of Chicago*) 1955.
- Patricia Sexton Scola, A.B. (*Goucher Coll.*) 1957, M.D. (*Boston Univ.*) 1961.
- Lowell Wendell Smith, s.B. (*West Texas Univ.*) 1953, D.D.S. (*Univ. of Texas*) 1957.
- John Joseph Speidel, A.B. (*Harvard Univ.*) 1959, M.D. (*ibid.*) 1963.
- Stefania Vago, M.D. (*Charles Univ., Czechoslovakia*) 1949.
- Donald Morgan Watkin, A.B. (*Hamilton Coll.*) 1943, M.D. (*Harvard Univ.*) 1946.
- Edwin Lincoln Wildner, A.B. (*Yale Univ.*) 1952, M.D. (*Univ. of Virginia*) 1956.
- Joseph Anthony Yacovone, A.B. (*Brown Univ.*) 1936, D.M.D. (*Tufts Univ.*) 1942.

## HARVARD UNIVERSITY

### MASTER OF INDUSTRIAL HEALTH

Lionel Melvin Lieberman, A.B. (*Univ. of Virginia*) 1948, M.D. (*ibid.*) 1952.

### MASTER OF SCIENCE IN HYGIENE

#### (in the field of Biostatistics)

Gary David Friedman, S.B. (*Univ. of Chicago*) 1956, M.D. (*ibid.*) 1959.

James Clark Graham Pearson, S.B. (*Univ. of St. Andrews, Scotland*) 1962.

#### (in the field of Community Air Pollution)

Malcolm Strang FitzPatrick, S.B. (*Yale Univ.*) 1959, B.E. (*ibid.*) 1960, S.M. (*Stanford Univ.*) 1961.

#### (in the field of Demography and Human Ecology)

James Henry Steere, A.B. (*Pomona Coll.*) 1949, S.B. (*Univ. of California*) 1951, D.V.M. (*ibid.*) 1953.

#### (in the field of Epidemiology)

Joseph Francis Fraumeni, A.B. (*Harvard Univ.*) 1954, M.D. (*Duke Univ.*) 1958.

Tomio Hirohata, M.D. (*Kyusku Univ., Japan*) 1960.

Richard Arlen Tjalma, S.B. (*Michigan State Univ.*) 1950, D.V.M. (*ibid.*) 1954.

#### (in the field of Industrial Hygiene)

Michael Oliver Varner, S.B. (*Calif. State Polytechnic Coll.*) 1963.

#### (in the field of Maternal and Child Health)

John Knox Miller, S.B. (*Davidson Coll.*) 1943, M.D. (*Tulane Univ.*) 1946, M.P.H. (*ibid.*) 1948.

#### (in the field of Microbiology)

Mary Ann McNichol, A.B. (*Boston Univ.*) 1957, A.M. (*ibid.*) 1959.

#### (in the field of Nutrition)

Johanna Todd Dwyer, S.B. (*Cornell Univ.*) 1960, S.M. (*Univ. of Wisconsin*) 1962.

Lorraine Kugell Jaffe, A.B. (*Univ. of Vermont*) 1963.

Vern Lee Schramm, S.B. (*South Dakota State Coll.*) 1963.

### MASTER OF SCIENCE IN HYGIENE

#### (in the field of Public Health Practice)

David Arthur Danielson, A.B. (*Boston Univ.*) 1960.

Robert Woodward Morgan, A.B. (*Harvard Univ.*) 1946, A.M. (*Boston Univ.*) 1960.

Robert Michael Moroney, A.B. (*Boston Coll.*) 1960, M.S.W. (*ibid.*) 1962.

## SCHOOL OF PUBLIC HEALTH

### (in the field of Radiological Health)

Andrew George Braun, A.B. (*Middlebury Coll.*) 1961, S.B. (*Massachusetts Institute of Technology*) 1961.

Michael Allan Davis, S.B. (*Worcester Polytechnic Institute*) 1962, S.M. (*ibid.*) 1964.

Gerald Samuel Parker, S.B. (*Northeastern Univ.*) 1953, S.M. (*Harvard Univ.*) 1955.

Anne Ward Schaefer, A.B. (*Trinity Coll.*) 1963.

### (in the field of Toxicology)

Richard Edwin Easton, A.B. (*Univ. of Kansas*) 1958, M.D. (*ibid.*) 1962, M.P.H. (*Harvard Univ.*) 1964.

On March 7, 1966 the following degrees were conferred:

### DOCTOR OF PUBLIC HEALTH

Louis Marie Francois Masse, M.D. (*Univ. of Paris, France*) 1951, M.P.H. (*Harvard Univ.*) 1959.

Thesis: Seasonal Changes In Health Status In Some West African Urban Communities

Special Field: Biostatistics

### DOCTOR OF SCIENCE IN HYGIENE

Leslie Michael Klevay, S.B. (*Univ. of Wisconsin*) 1956, M.D. (*ibid.*) 1960, S.M. IN HYG. (*Harvard Univ.*) 1962.

Thesis: Dietary Fat And Bile Acid Excretion In The Perfused Liver

Special Field: Nutrition

Parker Cramer Reist, S.B. (*Pennsylvania State Univ.*) 1955, S.M. (*Massachusetts Institute of Technology*) 1957, S.M. IN HYG. (*Harvard Univ.*) 1963.

Thesis: The Disposal Of Radioactive Krypton-85 In Porous Media

Special Field: Radiological Health

### MASTER OF SCIENCE IN HYGIENE

#### (in the field of Aerospace Health and Safety)

Won Chuel Kay, M.D. (*Severance Union Med. Coll., Korea*) 1954, D.M.SC. (*Yunsei Univ., Korea*) 1964.

#### (in the field of Industrial Hygiene)

Darrell Eugene Anderson, B.CH.E. (*Univ. of Minnesota*) 1958.

#### (in the field of Nutrition)

Shirley Kathryn DeSimone, A.B. (*Univ. of Buffalo*) 1956, A.M. (*ibid.*) 1962.

#### (in the field of Physiology)

Ralph English Miller, A.B. (*Dartmouth Coll.*) 1958, M.D. (*Harvard Univ.*) 1961.



# Index

## *Officers of Administration, Instruction and Research*

- |                                  |             |                            |                      |
|----------------------------------|-------------|----------------------------|----------------------|
| Abelin, T. . . . .               | 19, 70      | Chernin, E. . . . .        | 17, 101              |
| Alpert, J. J. . . . .            | 119         | Claff, W. L. . . . .       | 13, 17, 110          |
| Amdur, M. O. . . . .             | 17, 85      | Coatney, G. R. . . . .     | 22, 101              |
| Andrus, S. B. . . . .            | 19, 123     | Cohn, H. D. . . . .        | 25, 118              |
| Antoniades, H. N. . . . .        | 19, 123     | Connelly, A. P. . . . .    | 27, 129              |
| Armstrong, R. A. . . . .         | 30, 129     | Cooke, L. S. . . . .       | 22, 81               |
| Augustine, D. L. . . . .         | 32          | Costin, C. D. . . . .      | 31, 118              |
| Austin, J. M. . . . .            | 21, 81      | Cowin, R. . . . .          | 31, 118              |
|                                  |             | Cox, H. R. . . . .         | 22, 92               |
| Baile, C. A. . . . .             | 25, 123     | Cronin, S. N. . . . .      | 31, 124              |
| Banasiewicz, M. . . . .          | 27, 123     | Croog, S. H. . . . .       | 19, 129              |
| Barnaby, M. G. . . . .           | 13, 21      | Crowley, T. J. . . . .     | 27, 85               |
| Bartholomay, A. F. . . . .       | 65          | Curran, W. J. . . . .      | 111                  |
| Beiser, M. . . . .               | 22, 129     |                            |                      |
| Bell, S. D., Jr. . . . .         | 17, 92      | Daggy, R. H. . . . .       | 12, 14, 17, 101, 149 |
| Bennett, G. F. . . . .           | 11          | Dammin, G. J. . . . .      | 102                  |
| Berenberg, W. . . . .            | 119         | Dane, J. K. . . . .        | 22, 81               |
| Berg, R. B. . . . .              | 119         | Danley, R. A. . . . .      | 27, 129              |
| Berliner, M. D. . . . .          | 27, 92      | Demian, E. S. . . . .      | 30, 102              |
| Bernstein, D. S. . . . .         | 124         | Demone, H. W., Jr. . . . . | 22, 110              |
| Berry, R. E. . . . .             | 111         | Densen, P. M. . . . .      | 22, 65               |
| Boutourline-Young, H. J. . . . . | 26, 85      | Drinker, P. . . . .        | 32                   |
| Bowie, E. J. . . . .             | 31, 124     | Drolette, M. E. . . . .    | 19, 65               |
| Brain, J. D. . . . .             | 27, 85      | Dunning, J. M. . . . .     | 111, 154             |
| Brandt, A. D. . . . .            | 22, 81      | Dyck, A. J. . . . .        | 134                  |
| Bruno, D. . . . .                | 31, 124     |                            |                      |
| Burden, R. P. . . . .            | 13, 89      | Edsall, G. . . . .         | 15, 92               |
| Burgess, W. A. . . . .           | 19, 81      | Ekdahl, M. C. . . . .      | 32, 119              |
| Burke, B. S. . . . .             | 32          | Eliot, M. M. . . . .       | 32                   |
| Burr, F. H. . . . .              | 11          | Elkins, H. B. . . . .      | 22, 85               |
| Butler, R. M. . . . .            | 27, 118     | Elson, C. E. . . . .       | 30, 124              |
| Buxbaum, R. C. . . . .           | 111         | Esterquest, R. T. . . . .  | 13, 21, 42           |
|                                  |             |                            |                      |
| Campbell, C. C. . . . .          | 17, 92, 101 | Fair, G. M. . . . .        | 33                   |
| Cardoza, V. G. . . . .           | 30, 129     | Fakhro, A. M. . . . .      | 30, 124              |
| Castellanos, H. A. . . . .       | 26, 123     | Farnsworth, D. L. . . . .  | 15                   |
| Chamberlin, D. B. . . . .        | 27, 85      | Fassett, D. W. . . . .     | 22, 85               |
| Chang, R. S. . . . .             | 17, 92      | Feeney, J. J. . . . .      | 13, 21               |
| Channin, E. A. . . . .           | 30, 86      | Feinleib, M. . . . .       | 19, 70               |

# SCHOOL OF PUBLIC HEALTH

Feldman, J. J. ....	17, 65, 118	Kaplinsky, E. ....	31, 124
Fendall, N. R. E. ....	22, 101	Kennedy, S. ....	11
Ferris, B. G., Jr. ....	17, 85	Kirkwood, S. B. ....	23, 101
Fiering, M. B. ....	89	Knudson, R. J. ....	31, 86
First, M. W. ....	17, 81	Koch-Weser, D. ....	13, 18, 101, 136
Forbes, W. H. ....	17, 85, 136	Kovar, E. B. ....	23, 110
Forsyth, J. H. ....	28, 123	Lamont, T. S. ....	11
Frank, N. R. ....	19, 85	Laskey, B. J. ....	13
Fraser, C. E. O. ....	28, 92	Latham, M. C. ....	28, 123
Frechette, A. L. ....	15, 110	Leavell, H. R. ....	33
Freydberg, N. ....	28, 129	Lee, S. S. ....	111
Frothingham, T. E. ....	18, 101	Leibenstein, H. ....	134
Galazka, A. M. ....	30, 93	Leighton, A. H. ....	14, 15, 129
Gerarde, H. W. ....	23, 81	Leith, D. E. ....	28, 86
Gershoff, S. N. ....	18, 123	Lesser, A. J. ....	23, 118
Geyer, R. P. ....	18, 123	Levey, S. ....	23, 110
Gideon, H. ....	27, 134	Levine, L. ....	32, 93
Gilbertson, D. E. ....	30, 102	Ley, H. L., Jr. ....	18, 70, 92
Girard, K. F. ....	28, 93	Lisco, H. ....	70
Gold, E. M. ....	23, 118	Little, J. B. ....	20, 85
Goldmann, F. ....	33	Lorian, V. ....	28, 93
Gorbach, I. E. ....	25, 118	Lown, B. ....	20, 123
Gordon, C. ....	32, 118	Ludwig, J. H. ....	23, 82
Gordon, J. E. ....	33	MacCready, R. A. ....	18, 92
Gore, I. ....	124	Mackworth, N. H. ....	26, 85
Gottlieb, M. S. ....	70	MacMahon, B. ....	14, 15, 70
Grommers, R. F. ....	28, 82	Mahoney, A. W. ....	31, 124
Hamilton, A. ....	33	Mahoney, J. R. ....	28, 82
Hardy, H. L. ....	82	Marbury, W. L. ....	11
Harrington, J. J. ....	19, 89	Mayer, J. ....	15, 42, 123, 140
Heer, D. M. ....	19, 65, 136	McCann, M. B. ....	28, 123
Hegsted, D. M. ....	15, 123	McCarthy, B. ....	31, 124
Heimann, H. ....	26, 85	McCarthy, G. ....	32, 119
Hendricks, N. V. ....	23, 81	McClellan, S. G. ....	18, 70
Herrera-Acena, M. G. ....	20, 123	McComb, D. E. ....	32, 93
Hitchcock, M. ....	30, 86	McCombs, H. L. ....	28, 123
Hoff, M. B. ....	32, 65, 118	McFarland, R. A. ....	15, 85
Hood, W. B., Jr. ....	28, 123	McGandy, R. B. ....	20, 123
Huber, A. M. ....	28, 123	McLaughlin, C. P. ....	111
Hunt, R. D. ....	124	Mead, J. ....	16, 85
Itscoitz, S. B. ....	31, 124	Michelson, E. H. ....	20, 101
Jacobs, A. R. ....	20, 110	Miettinen, O. S. ....	20, 65, 70
Janeway, C. A. ....	119	Miller, J. M. ....	29, 123
Kane, R. K. ....	11	Miller, L. ....	29, 118
		Miller, R. E. ....	31, 85
		Miller, R. W. ....	24, 70

## HARVARD UNIVERSITY

- Mitchell, R. . . . . 89  
 Moeller, D. W. . . . . 18, 75, 81  
 Monroe, R. G. . . . . 86  
 Moore, E. W. . . . . 89  
 Moore, R. C. . . . . 27, 85  
 Morris, J. C. . . . . 89  
 Most, H. . . . . 24, 101  
 Muench, H. . . . . 33  
 Murphy, J. M. . . . . 20, 129  
 Murphy, S. D. . . . . 20, 85  
 Murray, E. S. . . . . 18, 92  
 Myers, M. L. . . . . 25, 123  
  
 Nangeroni, A. L. . . . . 29, 129  
 Neave, C. . . . . 26, 70  
 Neva, F. A. . . . . 16, 101  
 New, M. L. . . . . 32, 65  
 Nichols, R. L. . . . . 20, 92  
 Nickerson, A. L. . . . . 11  
 Nolan, J. H. . . . . 29, 129  
  
 O'Connor, J. D. . . . . 32, 93  
 Olsen, F. R. . . . . 29, 123  
  
 Paffenbarger, R. S., Jr. . . . . 24, 70  
 Pan, S. C. . . . . 20, 101  
 Pennell, R. B. . . . . 24, 92  
 Penrose, M. D. . . . . 13, 14, 163  
 Peters, J. H. . . . . 29, 93  
 Peters, J. M. . . . . 20, 85  
 Peterson, O. L. . . . . 111  
 Phillips, H. T. . . . . 24, 110  
 Pickett, R. M. . . . . 29, 86  
 Plank, S. J. . . . . 20, 136  
 Potter, R. B., Jr. . . . . 134  
 Pugh, T. F. . . . . 18, 70  
 Pusey, N. M. . . . . 11, 12, 14, 63  
  
 Rammelkamp, C. H. . . . . 24, 92  
 Reca, M. E. . . . . 29, 93  
 Reed, R. B. . . . . 14, 16, 65  
 Reid, D. E. . . . . 119  
 Reist, P. C. . . . . 20, 81  
 Remmell, P. S. . . . . 25, 123  
 Renthall, A. G. . . . . 25, 110  
 Reville, R. . . . . 12, 16, 134  
 Rice, E. P. . . . . 18, 110, 118  
 Roberge, G. J. . . . . 31, 124  
  
 Roca-Garcia, M. . . . . 27, 92  
 Rose, H. E. . . . . 29, 123  
 Rosenthal, G. D. . . . . 111  
 Russell, P. F. . . . . 24, 102  
 Ryan, G. A. . . . . 31, 86  
  
 Sachs, B. . . . . 25, 118  
 Safilios-Rothschild, C. . . . . 29, 134  
 Salhanick, H. A. . . . . 16, 134  
 Schmidt, W. M. . . . . 14, 16, 118  
 Schoonmaker, J. A. . . . . 32, 124  
 Sears, C. C. . . . . 25, 102  
 Seeler, A. O. . . . . 82  
 Segall, A. J. . . . . 21, 70  
 Seltzer, C. C. . . . . 27, 123  
 Shapiro, D. S. . . . . 24, 129  
 Shapiro, J. . . . . 21, 81  
 Shattuck, G. C. . . . . 33  
 Shaw, J. H. . . . . 124  
 Sidel, V. W. . . . . 111  
 Siegel, M. . . . . 24, 70  
 Simmons, S. W. . . . . 25, 102  
 Smith, C. A. . . . . 119  
 Smith, R. M. . . . . 33  
 Snedeker, L. . . . . 119  
 Snyder, J. C. . . . . 12, 14, 16, 92, 136  
 Spaulding, R. B. . . . . 12, 14, 21  
 Spielman, A. . . . . 21, 101  
 Spielman, J. M. . . . . 32, 93  
 Stare, F. J. . . . . 14, 16, 123  
 Sternfeld, L. . . . . 18, 118  
 Stevens, C. M. . . . . 111  
 Stigol, L. C. . . . . 29, 86  
 Stocker, G. . . . . 13  
 Stoudt, H. W. . . . . 21, 85  
 Stuart, H. C. . . . . 33  
 Stumm, W. . . . . 89  
 Suarez, A. C. . . . . 32, 129  
  
 Teele, J. E. . . . . 21, 118  
 Thomas, H. A., Jr. . . . . 16, 89, 134  
 Tseng, W. . . . . 30, 70  
 Tyler, J. M. . . . . 29, 86  
  
 Uzgiris, V. I. . . . . 29, 134  
  
 Valadian, I. . . . . 19, 118  
 Vassaux, C. E. . . . . 31, 124

# SCHOOL OF PUBLIC HEALTH

Velez, H. ....	29, 124	Wilson, R. J. M. ....	31, 102
Viles, F. C., Jr. ....	27, 81	Winters, W. E. ....	134
Vinson, J. W. . . . .	27, 92	Wittenberg, S. M. ....	31, 124
von Lichtenberg, F. C. ....	102	Wohl, M. E. B. ....	86
Wachman, A. ....	31, 124	Woodward, R. L. ....	26, 89
Watson, R. B. ....	16, 101	Worcester, J. ....	17, 65, 70
Wechsler, H. ....	25, 110	Wyckoff, P. S. ....	13, 134
Weinstein, L. ....	93	Wyon, J. B. ....	26, 136
Weir, J. M. ....	25, 102	Yacovone, J. A. ....	26, 110
Weller, T. H. ....	12, 14, 16, 91, 101	Yankauer, A. ....	26, 118
Whittenberger, J. L. 12, 14, 16, 75, 81, 85		Yen, S. B. ....	31, 70
Wiech, N. L. ....	30, 124	Yerby, A. S. ....	12, 14, 17, 110, 152
Wilkins, G. F. ....	19, 81	Young, M. A. C. ....	19, 110
		Yuan, G. C. ....	30, 93



## Subject Index

- Academic calendar, 9-10.  
 Administrative Board, 14.  
 Administrative Officers, 12-13.  
 Admission, 49-61; general requirements, 49-50; application procedures, 49-50; as a special student, 60; deadline for application, 49-50; English language requirement, 49; financial requirement for foreign students, 50; references, 49; requirements for degrees, 51, 53, 55, 56, 57; transcripts, 49.  
 Adviser, for Doctoral Program, 57-58.  
 Aerospace medicine, 60.  
 Air pollution, 76, 77, 79, 82, 83, 84.  
 American Board of Dental Health, certification by, 60.  
 American Board of Preventive Medicine, certification by, 60, 71, 146.  
 Applications, *see Admission*.  
 Applications for admission, from students outside the United States, 49-50.  
 Applications for fellowships and traineeships, 164.  
 Aviation Health and Safety, 75, 77.  
  
 Behavioral Sciences, Department of, 129-133; aims of, 129-130; courses in, 130-133; staff of, 129.  
 Bills, payment of, 159-160; *see also Fees*.  
 Biostatistics, Department of, 65-69; aims of, 65-66; courses in, 66-69; staff of, 65.  
 Buildings of the School of Public Health, 38-39; *see also Map*, inside rear cover.  
  
 Calendar, Academic, 9-10.  
 Center for Data Processing, 66, 69.  
 Center for Environmental Health, *see Kresge Center for Environmental Health*.  
 Center for Population Studies, 134-139; aims of, 134-135; departments represented, 134-135; courses in, 136-139; staffs of, 134-135, 136.  
 Center for the Prevention of Infectious Diseases, 91-109; aims of, 91, 93-95, 102-103; courses in, 93-100, 102-109; departments in, 91-109; staffs of, 91, 92-93, 101-102.  
 Certification, by the American Board of Preventive Medicine, 60; of adequate financial resources, 50.  
 Child Health, *see Maternal and Child Health*.  
 Children, facilities for, 42-45.  
 Clinics and laboratories, facilities of, 39-40.  
 Computers, 66, 69.  
 Corporation, The, 11.  
 Countway Library of Medicine, 40-42.  
 Courses, descriptions of, 63-141.  
 Credit units, required for degrees, 51-53, 54-55, 55-56.  
 Cross-registration in course offerings, at Harvard University, 145-146; at Massachusetts Institute of Technology, 145-146.  
  
 Data Processing Center, 53, 55, 66, 69.  
 Deadline dates, for admission application, 49-50; for doctoral thesis, 58-59.  
 Degree Candidates and Full-time Special Students, 1965-66, list of, 167-170.  
 Degrees, requirements for, Master of Public Health, 51-53; Master of Science in Hygiene, 53-55; Master of Industrial Health, 55-56; Doctor of Public Health, 56-59; Doctor of Science in Hygiene, 57-59; in Engineering, 61.  
 Degrees conferred, 172-175.  
 Degrees in Engineering, 61.  
 Demography and Human Ecology, Department of, 136-139; aims of, 136-137; courses in, 137-139; staff of, 136.

- Dental Public Health, postdoctoral fellowship program in, 153-154; residency program in, 60.
- Design of Investigations, in Biostatistics, 66-67; in Epidemiology, 72; in Demography and Human Ecology, 137.
- Division of Engineering and Applied Physics, of Harvard Graduate School of Arts and Sciences, 39.
- Division of International Health, 145-150.
- Doctor of Public Health degree, requirements for, 56-57.
- Doctor of Science in Hygiene degree, 37, 57-59.
- Doctoral degree requirements, 57-59.
- Doctoral program adviser, 57-58.
- Emeriti Professors, 32-33.
- Employment, 164.
- Engineering, degrees in, 61.
- English language requirement, 49.
- Environmental Health, *See Kresge Center for Environmental Health.*
- Epidemiology, Department of, 70-74; aims of, 71; courses in, 71-74; staff of, 70.
- Expenses and fees, 50, 158-164.
- Facilities available to School, 38-45, 148, 163-164.
- Faculty, officers of instruction and research, 15-33.
- Family accommodations, 42-45, 163-164.
- Fees, 50, 158-164.
- Fellowship grants, from Atomic Energy Commission, 166; from Children's Bureau, 165; from Harvard University, 166; from National Aeronautics and Space Administration, 166; from U. S. Public Health Service, 71, 165; postdoctoral program in Dental Public Health, 153-154.
- Fertility control, 134-139.
- Field studies, 80, 117, 122, 133, 139, 160.
- Financial aid, 50, 60, 164-166.
- Financial support guarantee, for foreign students, 50.
- Foreign language requirements, for doctoral degrees, 58.
- Foreign students, 42-45, 49, 50, 58, 148, 157-158, 163.
- General Preventive Medicine, training programs in, 60, 146, 151.
- Geographical Origins of Students, table, 171.
- Harvard Divinity School, 135.
- Harvard Graduate School of Arts and Sciences, 34, 39, 53, 61, 75-76, 82, 89-90, 111, 115, 116, 124, 135, 145.
- Harvard Graduate School of Business Administration, 111, 112, 113, 115, 116, 151.
- Harvard Graduate School of Design, 135.
- Harvard Graduate School of Education, 135.
- Harvard Graduate School of Public Administration, 111, 113, 115, 116, 135, 145, 151.
- Harvard Law School, 111.
- Harvard Medical School, 34-35, 39, 40-41, 111, 112, 113, 115, 116, 134-135, 151, 164.
- Harvard School of Dental Medicine, 60, 111, 153-154.
- Harvard University, availability of courses in other departments, 39, 53, 61, 75-76, 80, 82-84, 89-90, 111-116, 124, 134-139, 145-155; Interfaculty Program on Health and Medical Care, 151.
- Health Education, 114; *see also Health Services Administration.*
- Health programs, *see Public Health.*
- Health Services Administration, Department of, 110-117; aims of, 111-112; courses in, 112-117; staff of, 110-111.
- Health services for students, 158, 161.
- History and Philosophy of Public Health, course in, 140.
- History of the School, 34-35.

## HARVARD UNIVERSITY

- Hospitalization insurance, for students, 158, 161; rates for family, 161.
- Hospitals, available facilities of, 39-40.
- Housing facilities, 42-45, 147-148, 163-164.
- Human Ecology, *See Demography, Department of.*
- Industrial Council for Tropical Health, 147-148.
- Industrial Hygiene, Department of, 81-84; aims of, 82; courses in, 82-84; staff of, 81-82.
- Infectious diseases, *see Center for the Prevention of Infectious Diseases.*
- Institute of Laboratories of Massachusetts Department of Public Health, 39-40.
- Instruction, new program of, 37-38; officers of, 15-32.
- Insurance, *see University Health and Insurance Plan.*
- Interdepartmental courses, 140-141.
- Interfaculty Program on Health and Medical Care, 151-152.
- International Health, programs in, 145-150.
- International House, Shattuck, 42-45, 148, 163-164.
- International research, 124, 146-147.
- International students, 6, 42-45, 49-50, 148, 157-158, 163-164.
- Investigations, *see Design of Investigations.*
- Kresge Center for Environmental Health, 75-90, aims of, 75-76, 82, 86; courses in, 76-80, 82-84, 87-88, 89-90; departments in, 75-80, 81-84, 85-88, 89-90; staffs of, 75, 81-82, 85-86, 89.
- Laboratories, facilities of, 39-40.
- Lecturers, in the Teaching Staff, 15-25.
- Lemuel Shattuck Hospital, 40.
- Library services, 40-41.
- Living expenses, 50, 158-164.
- Location of School of Public Health, 38-39, *see also* Map, inside back cover.
- Map, Harvard School of Public Health in the Medical Area, inside back cover.
- Massachusetts Department of Public Health, relationship with the School, 39-40, 59-60, 112, 153-154; residency programs with, 60, 153-154.
- Massachusetts Institute of Technology, collaboration with, 35, 39, 42, 53, 124, 145, 146, 151.
- Master of Industrial Health degree, requirement for, 55-56.
- Master of Public Health degree, 36-37; new curriculum for, 37-38; requirements for, 51-53.
- Master of Science in Hygiene degree, 37; requirements for, 53-55.
- Maternal and Child Health, Department of, 118-122; aims of, 119-120; courses in, 120-122; staff of, 118-119.
- Medical Area Health Service, 161.
- Medical Care, and Provision of Health Services, 111-117; administrative problems in, 116; economics of, 115-116; Harvard University Interfaculty Program on Health and, 151-152; issues in, 113.
- Medical care for students, 158, 161.
- Medical examinations, for students, 161.
- Mental health and mental illness, 129-133.
- Microbiology, Department of, 92-100; aims of, 93-95; courses in, 95-100; staff of, 92-93.
- National Institutes of Health, 94, 103, 164-166.
- New Program of Instruction, 37-38.
- Nutrition, Department of, 123-128; aims of, 124-125; courses in, 125-128; staff of, 123-124.
- Objectives of the School, 35-38.

- Occupational diseases, 75-76, 77-79, 82-84.
- Occupational Medicine, training program in, 60.
- Oral examination for doctorate, 57.
- Orientation meetings, 9, 157.
- Parasitic diseases, 102-103, 104, 106, 108, 109.
- Payment of fees, 159-160.
- Physiology, Department of, 85-88; aims of, 86-87; courses in, 87-88; staff of, 85-86.
- Population Growth, *see Center for Population Studies*.
- Preventive Medicine, 60, 75-88, 141, 146, 151.
- Program on Health and Medical Care, Harvard University Interfaculty, 151-152.
- Programing, Computer, 66, 69.
- Programs in International Health, 124, 145-147.
- Programs for specialists, 38.
- Public Health, administrative problems of, 116; dental health programs in, 114-115; education, 114; history and philosophy of, 140; interrelationships of economic development and, 115; issues in, 113; legal problems in, 114; nutrition, 125; policies, 140; residencies in, 60; services for handicapped children in, 119-120; status of, 111-112; teaching of preventive medicine and, 141; welfare programs and their relation to, 120-121; *see also Health Services Administration and Tropical Public Health*.
- Qualifying examination, for doctorate, 57, 58.
- Radioactivity, 76, 77, 82, 84.
- References for admission applications, 49.
- Registration, for International Students, 9, 157; for U. S. Students 9, 157; for students enrolled in 1965-66, 9, 157.
- Reinstatement regulations, 160.
- Requirements for degrees, 36-38, 49-50, 51-53, 54-55, 55-56, 56-57, 57-59, 61.
- Research, in Behavioral Sciences, 129, 131, 133; in Biostatistics, 65, 67, 69; in Center for Population Studies, 134-135; in Center for the Prevention of Infectious Diseases, 91, 93-94, 95-96, 99-100, 103, 104, 108-109; in Community Health, 67-68; in Demography and Human Ecology, 136, 138, 139; in Epidemiology, 71, 73, 74; in Harvard University Interfaculty Program on Health and Medical Care, 151-152; in Health Services Administration, 112, 116; in Industrial Hygiene, 82, 84; in International Health, 146-148; in Maternal and Child Health, 121-122; in Microbiology, 93-94, 95-96, 99-100; in Nutrition, 126; in Physiology, 86, 88; in Tropical Public Health, 103, 104, 108-109; statistical methods, 67.
- Research staff, 26-32.
- Residence requirements for degrees, 51, 54, 55, 57.
- Residency Programs, 60.
- Role of the school, 36-38.
- Sanitary Engineering, Department of, 89-90; courses in, 89-90; staff of, 89.
- Schedule of courses, 63-141.
- Scholarship grants, *see Fellowship grants*.
- Shattuck International House, 42-45, 148, 163-164.
- Special students, 61, 170.
- Statistical methods in research, 67.
- Student application, from outside the United States, 49.
- Student Health Service, 158, 161.
- Teaching staff, 21-26.
- Thesis for doctoral degree, 57-59.



## HARVARD UNIVERSITY

Traineeship grants, *see Fellowship grants.*

Transcripts for admission application, 49.

Tropical Public Health, Department of, 101-109; aims of, 102-103; courses in, 103-109; staff of, 101-102.

Tutorial program, in Behavioral Sciences, 133; in Biostatistics, 69; in Demography and Human Ecology, 139; in Health Services Administration, 116; in Industrial Hygiene, 84; in Maternal

and Child Health, 121; in Nutrition, 127; in Physiology, 88; in Teaching of Preventive Medicine and Public Health, 141.

University Health and Insurance Plan, 161.

University of Puerto Rico, School of Medicine, 122, 160.

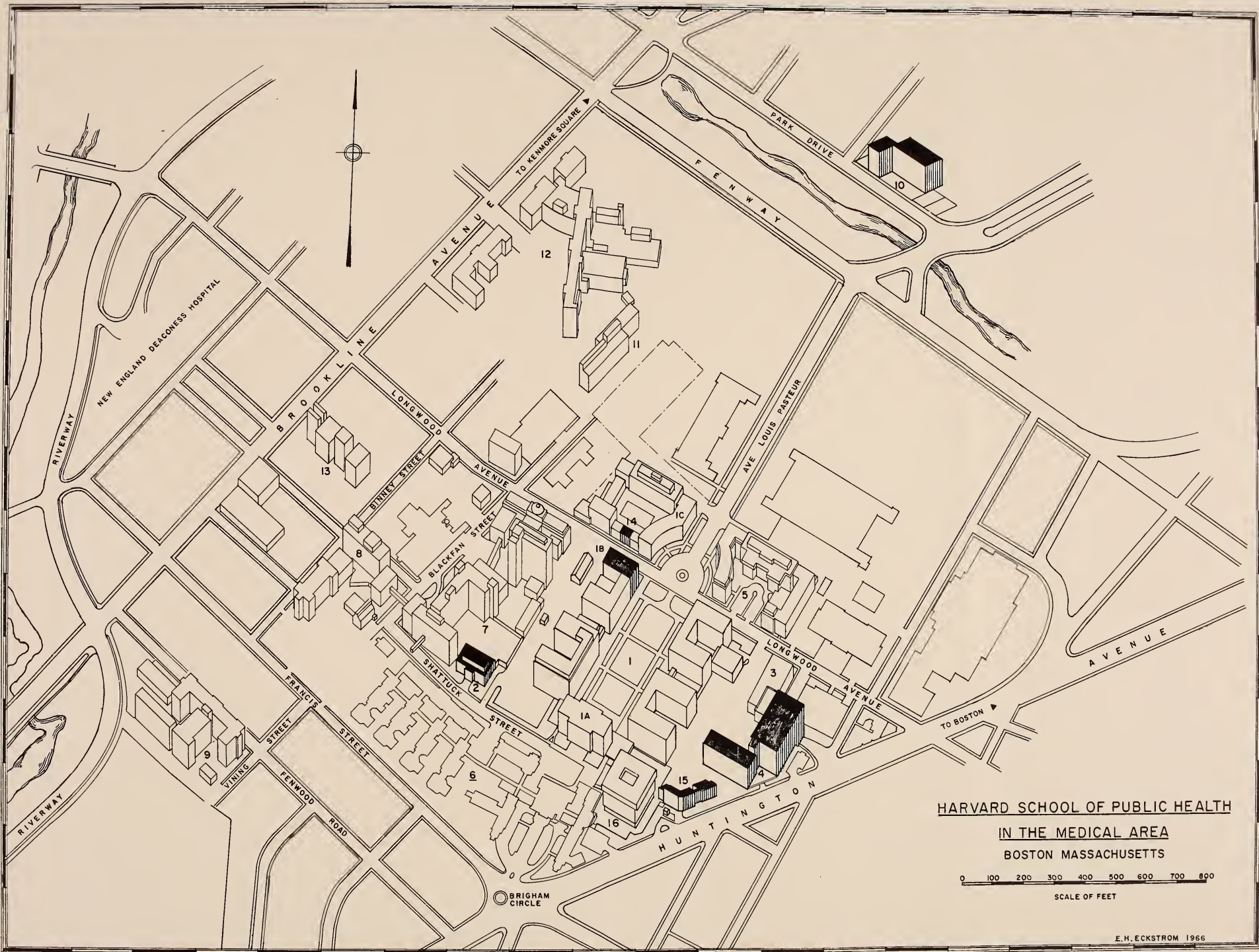
Vaccination, smallpox, 161.

Withdrawal from School, 160.



## KEY TO MAP ON OPPOSITE PAGE

- 1 HARVARD MEDICAL SCHOOL  
25 Shattuck Street  
A Administration  
B E2 Building  
Department of Tropical  
Public Health, School of  
Public Health  
C Vanderbilt Hall  
107 Avenue Louis Pasteur
- 2 HARVARD SCHOOL OF PUBLIC  
HEALTH  
55 Shattuck Street  
Administration  
Behavioral Sciences  
Health Services Administration  
Maternal and Child Health
- 3 HARVARD SCHOOL OF DENTAL  
MEDICINE  
188 Longwood Avenue
- 4 HARVARD SCHOOL OF PUBLIC  
HEALTH  
665 Huntington Avenue  
Kresge Center for Environmen-  
tal Health (Industrial Hy-  
giene and Physiology)  
Demography and Human Ecol-  
ogy  
Nutrition
- 5 BOSTON LYING-IN HOSPITAL  
221 Longwood Avenue
- 6 PETER BENT BRIGHAM HOSPITAL  
721 Huntington Avenue
- 7 CHILDREN'S HOSPITAL MEDICAL  
CENTER  
300 Longwood Avenue
- 8 CHILDREN'S CANCER RESEARCH  
FOUNDATION (Jimmy Fund)  
35 Binney Street
- 9 MASSACHUSETTS MENTAL HEALTH  
CENTER  
74 Fenwood Road
- 10 HENRY LEE SHATTUCK INTERNA-  
TIONAL HOUSE  
199-207 Park Drive
- 11 JUDGE BAKER GUIDANCE CENTER  
295 Longwood Avenue
- 12 BETH ISRAEL HOSPITAL  
330 Brookline Avenue
- 13 SHIELDS WARREN RADIATION LAB-  
ORATORY  
10 Binney Street
- 14 MEDICAL AREA HEALTH SERVICE  
275 Longwood Avenue
- 15 HARVARD SCHOOL OF PUBLIC  
HEALTH (Huntington Building)  
1 Shattuck Street  
Biostatistics  
Epidemiology  
Microbiology
- 16 FRANCIS A. COUNTWAY LIBRARY  
OF MEDICINE  
10 Shattuck Street



HARVARD SCHOOL OF PUBLIC HEALTH  
IN THE MEDICAL AREA  
BOSTON MASSACHUSETTS







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